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THE

# MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—10TH YEAR.

SYDNEY: SATURDAY, MAY 12, 1923.

No. 19.

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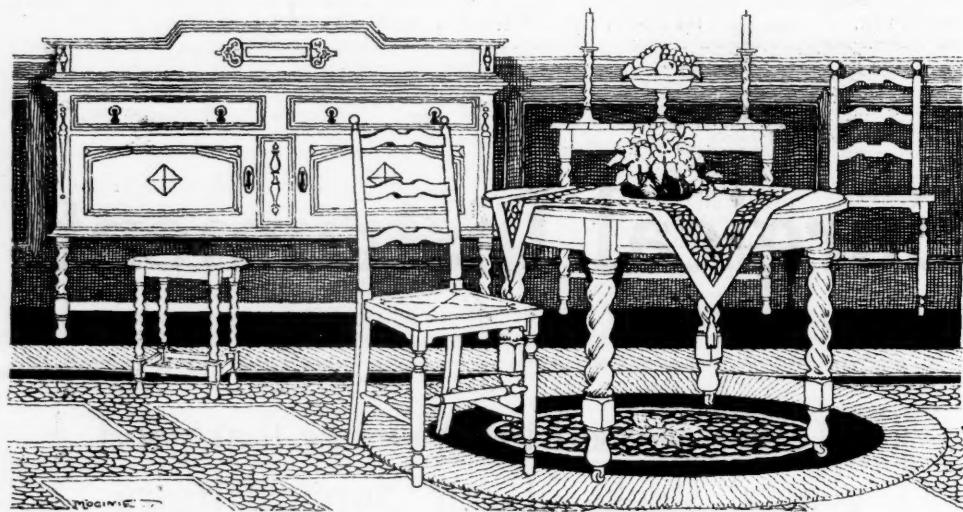
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### SURGICAL TREATMENT OF TUBERCULOUS DISEASE OF THE SHOULDER JOINT.<sup>1</sup>

BY E. D. AHERN, M.B., B.S. (MELBOURNE),  
Honorary Surgeon, Mater Misericordiae Public Hospital,  
Brisbane; Consultant Surgeon, Department  
of Repatriation.

ALTHOUGH this disease forms only 2% of the tuberculous diseases of the joints, it is a crippling and therefore important lesion which must always be looked for following injuries to the shoulder joint. The commonest lesion in the area under consideration is probably sub-deltoid bursitis and tuberculous disease must always be diagnosed from it. I have been officially informed that a long paper is not required, so will not go into details of the diagnosis and the pathology beyond calling attention to a few points.

The disease is rare before the age of two and over the age of twenty-five and is occasionally associated with apical disease of the lung of the same side. Primary disease is generally in the head of the humerus and only very rarely in the scapula or the synovial membrane. The onset of the disease

is usually preceded by an injury and is gradual; that is the reason why sub-deltoid bursitis may be mistaken for tuberculous disease. The disease, being so insidious in onset, is often far advanced before the real condition is suspected and by that time the general health is undermined by toxæmia and pain. At this stage there is present wasting of all the shoulder muscles, especially the deltoid. In traumatic bursitis the deltoid is the first to atrophy, but the other muscles do not waste to the same degree as in tuberculous disease. There is usually a tender spot just lateral to the coracoid process or at the posterior margin of the deltoid, depending on whether the anterior or posterior part of the head be affected. There is an increase in temperature over the affected joint when the disease is far advanced and all movements of the joints are restricted, especially that of abduction. Diagnosis depends on an evening rise in temperature, tenderness on pressure over the joint, restricted movement and demonstration of loss of bony substance by an X-ray photograph. Dr. Nisbet will show you tonight a picture of one boy's shoulder taken before operation and you will see in the boy himself the results of surgical treatment carried out three years before. You will notice the sequestra and would assume that the outward signs would be easily dis-

<sup>1</sup> Read at a meeting of the Queensland Branch of the British Medical Association on March 2, 1923.

cerned, but I can assure you that I was not absolutely sure myself until I saw that photograph. This boy had some ounces of pus around two large sequestra and lost a good deal of his humeral head as the result of four years' damage. The other patient I am showing you had no fluid in his joint and practically no pus, but a worm-eaten articular cartilage and a small area of caries at the posterior part of the head of the bone.

These two cases illustrate the two types usually met with, namely, the fluid form, with pus and fluid in the joint, and the dry, carious form. The best results to be hoped for in the expectant treatment of cases at all advanced is an ankylosed shoulder joint and a feeling of uncertainty as to the permanency of cure. It is generally agreed that the results in the expectant treatment in tuberculous disease of the shoulder joint are very much less satisfactory than in other joints. We gave the patient with dry caries a long trial with fixation and combined tuberculin and sanatorium treatment at Stanthorpe without any improvement. I even cut down on this joint once and found so little evidence of disease outside it, that I closed the wound and again persisted with fixation treatment, but finally had to resect the affected part. The safest and quickest return to health would seem to be effected by operative treatment, which is the main theme of this short paper. The operative procedures have been designed to deal with the disease in its various stages and situations and the more conservative it is, consistent with adequate removal of the disease, the better the final result. There are many operations designed to deal with this lesion of the shoulder joint; beyond mentioning them casually, I will not weary you with descriptions which can be obtained from any work on operative surgery.

The operation designed by Ollier readily exposes the bicipital groove and allows the tendon sheath to be inspected and dealt with according to its pathology. It is the best approach for disease of the anterior portion of the head. To achieve success in securing a joint, either ankylosed in the best position or if fascia has been inserted with the idea of producing a movable joint, it is absolutely necessary to carry out the resection of bone as far as possible sub-periosteally. The tendons attached to the great tuberosity should be lifted sub-periosteally from the bone, or, better still, the tuberosity should be chiselled away, a thin layer of bone being left attached to the tendinous insertion. This method, of course, is only feasible when the underlying bone is healthy. It is essential to leave the deltoid and rotator muscles intact if it is desired to secure a movable joint. Excision of the joint offers no particular danger and, except in the very advanced cases, good results should be secured. The reason why we do not get better results usually arises from the changes in the muscles which occur so frequently before operation, particularly in the deltoid, such as severe atrophy, sinus formation and cicatricial contraction, which interfere locally with the functional result. The extent of the disease is another governing factor and the less bone removed

consistent with safety, the better the result. Where a large portion of the head or the whole of it has to be removed, special measures are necessary, such as special splinting in after-treatment or the question of transferring the insertions of the scapulo-humeral muscles lower down the shaft of the humerus.

When an ankylosis of the joint is to be expected, it is necessary to insure that fixation occurs in the position in which most use can be made of the limb by movements of the scapula through the acromio-clavicular and sterno-clavicular joints. The position recommended by Sir Robert Jones is one of 70°, with the arm pointing slightly forward. At this angle the arm can be brought to the side when at rest and can be abducted to at least the level of the shoulder joint and generally much higher. The angles estimated when the vertebral border of the scapular is vertical or parallel to the spinal column. If so much of the upper end of the humerus has to be removed that the production of a flail joint must be feared, then measures to prevent it must be considered, such as fixation by splint, nailing the head to the scapula, grafting of bone or, perhaps, transferring the insertion of deltoid and rotators lower down the humerus. The fixation by splints in these cases must be maintained until the soft parts have contracted and the deltoid muscle retracted. The arm should be fixed at right angles to the body and kept pulled to the scapula by means of adhesive strapping. This position must be maintained for at least three months and special attention paid to the muscles in the way of massage, hot air and electrical stimulation. If at the end of three months the arm can be held abducted, it means that the deltoid has regained its function and the splint is then lowered day by day closer to the trunk. If at the end of a week of this gradual lowering the deltoid still maintains its function, the splint may be again lowered gradually until the arm reaches the side. Even then the splint should be worn for a part of the day, until there is no doubt whatever concerning the functional recovery of the deltoid muscle. If at any time during the lowering process there is any loss of function, the splint should be again raised and another rest given in the abducted position before persisting with these manoeuvres. If no success be obtained at the end of three months' treatment, an ankylosis should be produced by operation. The after-treatment is most important and consists of two essentials, splinting in the right position and proper treatment of the affected muscles, particularly the deltoid. Right-angled abduction is generally recognized as the most satisfactory position and can be quite efficiently maintained by the aeroplane splint.

The two young men I am showing you to-night were operated on by Ollier's method, all bone being removed sub-periosteally, and were treated afterwards in an aeroplane splint, combined with massage, hot air and electrical stimulation. Results, as you see, are very satisfactory in that both of them can use the upper limb for the majority of the everyday requirements and both are able to carry on their duties of life to advantage.

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The boy who had the dry type of the disease, can put his hand beyond the middle line at the back to just below the scapula. In the forward direction he can almost point his elbow straight forward and is able to put his hand, palm forwards, on the nape of his neck. In the abducted position he can raise his elbow above the horizontal. The other boy has a more restricted range of movement resulting from more advanced disease and from greater damage of his deltoid muscle.

#### PROBLEMS OF ACUTE OSTEO-MYELITIS.<sup>1</sup>

By NEVILLE G. SUTTON, M.B., CH.M. (SYD.), F.R.C.S. (EDIN.),  
Honorary Surgeon, Hospital for Sick Children, Brisbane.

THE subject of acute infective osteo-myelitis has been one of great interest to me for a number of years, as a matter of fact since I read a brilliant and convincing clinical talk by the late J. B. Murphy, of Chicago, in the April, 1915, number of his well-known *Clinics*.<sup>(1)</sup> As I have had the management during the last three years of a number of children suffering from this disease, I thought it would be acceptable to you to hear the conclusions I have formed on this subject from my own work and from a study of some of the recent literature dealing with it.

At the onset I wish to make it clear that I intend to discuss only acute infective, or, as it is sometimes called, suppurative osteo-myelitis, that is, the disease in which osteo-myelitis occurs as a primary infection of bone and not those cases in which the bone is infected in the course of compound fractures or disease of the adjacent soft parts.

It is not a very common disease and, as it occurs most frequently in children and adolescents, many of the patients are treated in children's hospitals, where the age limit is usually twelve years. In the Hospital for Sick Children, Brisbane, there were fifteen children treated for this disease during the year 1922; the total admission for the year were 3,634, so that acute osteo-myelitis accounted for only 0.4% of the admissions. There are, however, many points about the disease which render it of considerable importance. Various aspects of the pathogenesis, diagnosis and treatment are of great interest and admit of some discussion. Considering the disease from an economic standpoint, we find, firstly, that the death rate in most series of cases is considerably over 10%. For example, in a series of thirty-five cases published by Pfeiffer, of the University Hospital, Philadelphia,<sup>(2)</sup> the death rate was 14.3%; in our cases of last year there were two deaths, which corresponds closely to the rate quoted. Secondly, this disease nearly always entails a prolonged stay in hospital—an average of five months with Pfeiffer's patients, excluding those who died. In our 1922 series the minimum stay in hospital was twenty-four days (excluding the patients who died) and the maximum cannot be stated, as three children are still in hospital after periods

of thirteen, ten and two months respectively. The average, however, for those who were admitted and discharged during the year, was about four months.

I quote these figures merely to show that we are dealing with a serious disease with a high death rate; one which is very costly to the community, when we realize that the cost of keeping one child in hospital during the past year was 9s. 2d. *per diem*.

Lastly, we must admit that we cannot claim to have effected a complete cure in many of the children that are discharged from hospital; some of them still have discharging sinuses; others, although their wounds are healed and the scars appear sound, are re-admitted after varying periods with a recurrence of the trouble and an open sinus; some have badly damaged limbs through the involvement of joints, which leaves them with more or less serious permanent disability.

#### Aetiology and Pathogenesis.

With regard to the aetiology, there are three prominent factors. In the first place the disease is very much more common in boys than in girls, the proportion being usually stated as three to one. In the patients we have been seeing, however, the preponderance of boys seems to be greater still, as among the last twenty-one admitted there has been no girl.

The second point is that there is very often a history of trauma preceding the onset of the acute trouble immediately or by a few days. Thus in fully half the cases we find there is a history of some local injury definitely remembered and described. It is often only some slight blow or a fall or a strain from over-exertion; in the remainder there is no mention made of anything of the kind, but we find that it is often difficult to get a full and reliable story of the illness, as a child when admitted to hospital is not always accompanied by a parent or some other person who can give us the exact details of the illness.

The third feature is the occurrence of the *Staphylococcus pyogenes aureus* as the infecting agent in the vast majority of cases. This fact is everywhere admitted. In speaking of acute suppurative osteo-myelitis it is now generally understood that it is the *Staphylococcus aureus* infection that is meant.

It is now recognized that the infection is carried in the blood from some primary focus and in many cases it is found that there has been an antecedent septic condition of the mouth or throat or pustular lesion of the skin; these are correctly blamed as the source of the offending organisms. Of course, bone infections occur as complications of many acute diseases, such as typhoid fever, scarlet fever, pneumonia *et cetera*, but these are not very common varieties and very often run a mild course. They occur as a rule late in the disease or during convalescence and do not present the acute dramatic onset so often seen with the staphylococcal infections.

I think we may take it that the trauma, by creating a *locus minoris resistentiae*, perhaps a small haematoma or a limited area of blood stasis, predisposes to the localization of the infection. This

<sup>1</sup> Read at a meeting of the Queensland Branch of the British Medical Association on March 2, 1923.

is the explanation of the greater frequency in boys. It is a fact that has the results of animal experiments to back it up. But surely it gives us food for consideration to realize that after an apparently trivial furuncle or other slight sepsis, staphylococci take it upon themselves to travel by the blood stream and settle down in a slightly injured bone, there to create a new conflagration demanding such urgent attention. It would appear that in most acute infections the organisms are set free into the blood stream. This is not only in the initial stages, when we can catch them and culture them from the blood, as, for example, in typhoid fever, but also in the later stages, for it is often found that the staphylococcal skin lesion is healed or healing when the bone infection commences, just as typhoid osteitis occurs most frequently late in the disease, when the fever is falling by lysis or in the actual stage of convalescence.

There are some acute fulminating cases of osteomyelitis in which the bone infection, often multiple, is apparently only an incident in a septicaemia. I have had two such cases quite recently. The blood cultures yielded *Staphylococcus aureus*, the bone being infected by the same organism. One of the children is apparently progressing and has overcome the septicaemia; the other is only just struggling on in the throes of an endocarditis.

These cases are always grave and probably account for the majority of the rapid deaths. It seems that there is some lowering of body resistance, so that the blood does not deal as effectively as usual with the micro-organisms which escape into it, and either allows them to pass to some suitable haven or else permits them to multiply and circulate freely, which condition we know as septicaemia. In short the whole subject of metastatic infections is one of great interest and considerable difficulty. It might be thought that at the termination of an acute infection there would exist some degree of immunity to the infecting organism and that the subject would be in a better position to resist metastasis. Does the metastatic infection occur during a negative phase of immunity? And do the organisms assume an enhanced virulence in their metastatic focus or is it merely the unyielding bony confines that so increase the general toxæmia in cases of osteo-myelitis? These are aspects of the question on which I confess I should like further enlightenment.

The next point to be considered is the location of the disease. We find that the long bones of the limbs are those that suffer most frequently and it is at the end of the shaft adjacent to the epiphysis that the infection commences, that is, at the epiphyseal end of the diaphysis or, as it is sometimes called, the metaphysis. It is a well-established clinical fact that those metaphyses at which growth is most active, are the most frequent sites of osteomyelitis, that is, the lower end of the femur, the upper end of the tibia and the upper end of the humerus. There are two facts which may throw some light on this localization. The bone at these sites is young and newly formed and consequently is most susceptible to trauma. It may also be re-

marked that these spots are very exposed to injury. The arteries in these situations are end arteries, being terminal branches of the nutrient artery which enters the bone near the middle of the shaft, or else the end branches of the fine vessels which enter the cortex of the bone from the periosteum, the circulation in these spots being sluggish and venous in character, thus favouring stasis.

It is probable that the infective process starts either in the medulla or in the sub-periosteal region of the cortex. Occasionally it may commence simultaneously in both these localities, but it is most likely that one or other of these spots is primarily affected and the infection rapidly extends through the communicating blood spaces to the other. It may be taken as a foregone conclusion that when there is a sub-periosteal accumulation of pus, the marrow is also infected. The disease does not begin as an epiphysitis and only secondarily and in rare cases does it spread to the epiphysis, the cartilaginous plate acting as a barrier in this direction. I say this with all due respect to the radiographer, who often reports that there is either nothing abnormal or else epiphysitis in the early stages of the disease. I believe that he is quite right in that he occasionally sees some change in the neighbourhood of the epiphyseal line, but it is on the dia-physial side of the cartilage and it is merely that his nomenclature is not accurate. He should report metaphysitis. In the majority of cases, however, there are practically no changes to be observed in the skiagram during the first week of infection.

Other bones besides the long bones are occasionally affected, such as the ilium, the vertebrae, the mandible *et cetera*, but such cases are not common and usually present difficult problems for diagnosis.

As occurs in inflammation in any part of the body due to staphylococci, there is at first exudation and later pus formation. In the case of the bones there is a rigid wall which cannot swell and expand with the pressure developed inside it by inflammatory exudates. This is probably the explanation of the reaction and the severity of the toxæmia, which is usually apparent within a short time. It does not take very long for such an acute inflammatory process, shut in and exerting increasing pressure, to cut off the blood supply and to destroy the vitality of the bone, especially if the only other source of blood supply, the periosteum, be separated from the cortex by inflammatory exudate or pus at the same time. In fact this bone destruction probably occurs in a matter of forty-eight or seventy-two hours after the commencement of an acute type of inflammation, as is borne out by the fact that very few of our patients escape subsequent operations (after the primary drainage) for the removal of dead bone. We are very rarely in time to prevent bone destruction, because our operations to relieve the tension and supply drainage are nearly always five to seven days or more after the onset.

Considering these facts, we have the key to the clinical features presented by these cases and the absolute indication for early diagnosis and intervention to prevent or minimize bone destruction.

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**Clinical Features and Diagnosis.**

I have now to consider what is, in my opinion, the most important problem of acute osteo-myelitis—making a correct diagnosis and making it at the earliest possible moment. Perhaps you may be surprised that I lay so much stress on these two points, but I feel I must tell you that of the twelve children sent to the hospital during the past fourteen months with a written note recording the diagnosis, who were proved to be suffering from acute osteo-myelitis by operation, subsequent course and later X-ray evidence, the diagnosis was correctly given in seven, the remainder being variously considered to be suffering from an acute infection of a joint, rheumatism, sepsis, thrombo-phlebitis and other conditions. Not only is this the case, but there is evidence that some of the children had been under medical supervision for some days, even when they were sent to the hospital with the correct diagnosis. It is evident that there is difficulty in diagnosing the condition correctly in the early stages, but it seems that we have made some progress and have advanced from the position which obtained in America in 1915, when Murphy wrote that he thought these cases were called "rheumatism" nineteen out of twenty times in general practice.

The diagnosis rests on accurate conception of the nature of the disease and of the clinical picture it presents, aided by a careful local examination.

The onset of the trouble is nearly always acute, that is, a definite day can be named as that on which it started; after that all the symptoms progress rapidly. Pain in the affected part is constantly complained of in the first instance and very often it is associated with loss of function, for example, limping when it is a bone of the lower limb or loss of the use of the arm when the upper limb is affected. The general signs of septic absorption usually appear quickly. There may be a rigor, but this does not seem so common in young children. However, it is often stated that the child became feverish or had "hot and cold turns" or something similar indicating a rise of temperature; without exception every child we had admitted in the acute stage of the disease, had a raised temperature; in the great majority it has been  $38.3^{\circ}$  C. ( $101^{\circ}$  F.) or higher and a correspondingly rapid pulse. It is also noticeable that a considerable percentage of the children had been delirious or rambling during the night or two prior to admission. In short, the child becomes rapidly ill and is usually very definitely toxæmic within a day or two of the onset. This is the usual story of the illness, but it must be realized that in a certain proportion of the cases the infective process does not seem to be quite so virulent and the general symptoms are not so definite; we may call the development of the disease sub-acute. A total leucocyte count will show a considerable leucocytosis, usually over 12,000, with a neutrophile cell proportion of 80% or more. Unless the child is delirious, complaints of pain in the affected region are always made and this leads to a local examination, which is the means of arriving at the accurate diagnosis.

In the early stages there is bone tenderness, but not superficial tenderness. This is an important

point which often seems to be missed or not fully appreciated. You may press or pinch the skin and underlying tissues without causing much discomfort in the first few days, but if you press a finger or two on the bone where it is accessible, you will always find considerable tenderness, either immediately or after maintaining the pressure for a few seconds, causing the child to cry out with pain, even though he be delirious. It is not only the presence of this bone tenderness, but also its exact localization that is important, for, as we have already seen, it is at the ends of the long bones close to the epiphysis that the trouble starts and this is the spot that is acutely tender. Now this, of course, is close to a joint, but usually an inch or more from the actual point line. It should be noted, however, that the joint itself is not tender or only very slightly so; the joint capsule and the actual epiphysis can usually be handled without complaint and, if care be exercised to hold the affected bone quite steady, the adjacent joint can be moved freely if it happens to be the knee, ankle or elbow; joints like the shoulder and hip may be held in a rigid state by muscular spasm. There is often an effusion into the adjacent joint after a few days, but this does not signify extension of the infection to the joint. It is an exudate that contains no organisms and is merely a part of the general oedema which is found to be developing in the parts lying about the infected bone. Of course, after the first few days the parts become oedematous and swollen and superficial tenderness develops, but the bone tenderness is always there and can be demonstrated if sought, though I think it is more difficult to be sure of this deep tenderness late in the course of the trouble, when an abscess of some size has developed under the periosteum or in the surrounding soft parts, for in these cases the bone may be quite inaccessible to the examining finger, being practically surrounded by a mass of pus and oedema, which is, of course, very tender to pressure. There are some cases that present great difficulties, for example, when deep-seated bones are affected and are evidently not very accessible, the neck of the femur near the epiphysis for the head or the vertebrae, the transverse processes of which seem to be the usual site of the trouble. The flat bones are occasionally the seat of metastatic infection, such as the bones of the cranial vault, the scapula and the ilium, and in the case of the last care is necessary that the condition is not diagnosed as appendicitis. This has been done with tragic consequences.

The differential diagnosis from acute infective arthritis and from acute rheumatism, which have a very similar onset, thus depends on the local examination; I think it is usually apparent. There is, however, one condition that occurs in children which may lead to confusion and this is infantile scurvy, for in this disease sub-periosteal extravasations of blood occur mainly in the course of the long bones of the limbs, giving rise to acute pain and tenderness and being accompanied by a raised temperature and often a general reaction. The important points in differentiating this disease are: It is most common during the latter half of the first year and the second year of life, whilst acute osteo-myelitis is

not very common in infants, the accompanying signs of scurvy are usually present if sought, spongy, bleeding gums if teeth are present, subcutaneous haemorrhages, especially in the eyelids, haematuria and the suggestive history of a diet deficient in fresh food. An X-ray plate usually shows the extravasated blood stripping up the periosteum in a very typical manner.

Thus we see that the presence of bone tenderness and its localization near the end of the shaft, but fully an inch or more from the joint line, in conjunction with the general signs and the suggestive history, which can usually be obtained if inquired for, are the important points which decide the diagnosis in the case of the bones of the limbs. But in cases in which bones inaccessible to examination are suspected, early diagnosis is often extremely difficult and it is only after an abscess has formed and gives definite signs or an X-ray picture shows commencing bone destruction that we are at all sure of the nature of the trouble. Of course, the severe pain and general condition of the patient may lead to earlier exploration.

#### Treatment.

I hope you all agree with me that surgical treatment is the only form of treatment worth discussion. It should be insisted on as soon as a diagnosis is made and the sooner that is the better for the patient in every way. Now I consider that this is a fact that admits of no argument, but I can refer you to at least one text-book of surgery of recent publication in which it is set out that in the earliest stages of the disease hyperaemia is indicated and should be employed until the diagnosis is definitely established and that when there is sufficient evidence that suppuration has occurred, the bone should be opened.

In the first place, it is extremely difficult to get the patients in the earliest stages, not always because of want of correct diagnosis, but often because of the failure of the responsible people to apply for medical aid as soon as they might. To put off surgical drainage for a day or two seems to me a confession of uncertainty as to the pathology and course of the disease and is bad teaching, for it surely lets the golden opportunity so seldom presented slide by. Secondly, the signs that pus has formed and needs letting out are surely signs that pus has accumulated under the periosteum or has burst through it into the soft parts. This does not occur until the damage has been done and the bone suffered more or less destruction from which it will not recover. The extent of this cannot be known till later. The bone destruction takes place early in the disease and the only way of preventing or of minimizing it is by providing early drainage for the inflammatory products and thus relieving the pressure inside the bone.

Now what should be the extent of the operative procedure in the early stages? About this there has been some considerable difference of opinion. The least radical intervention recommended is incision down to and including the periosteum; this is the conclusion to which Brandt, a German writer, has come in 1922, on consideration of the statistics

for the past twenty years at the University Hospital in Halle. He bases this opinion on the comparison of the death rate of patients in whom bone was resected and of patients in whom the periosteum was merely incised; the death rate in the former was 29.41% and in the latter 19.97%. As my knowledge of this paper is only through the "Epitome of Current Medical Literature" published in *The British Medical Journal*,<sup>(4)</sup> I am afraid it is unwise to criticize these statistics, except to remark that apparently twice as many patients were treated by bone resection and nothing is stated in the "Epitome" about the selection of patients. It is quite possible that in more serious cases the bone was more often opened up and some weight is lent to this surmise by further statistics showing that the complications, such as metastases in other bones and in soft parts and pyarthroses, were twice as common in the bone resection cases as in those in which the periosteum was merely incised—a very suggestive fact. This is an example of the case for conservative operations. At the other extreme we have the recommendation that the whole diaphysis should be resected sub-periosteally when the surgeon is dealing with infection of one of two parallel bones, otherwise the shaft should be very freely chiselled open and curetted.

Ochsner and Crile, in a review of three hundred and one cases of osteo-myelitis, published in *Surgery, Gynecology and Obstetrics*,<sup>(5)</sup> come to the conclusion that it is never advisable to resect the whole shaft in the acute stage of osteo-myelitis, an opinion which carries much weight and can be readily understood and confirmed by a little consideration and experience. These same writers conclude that the operation in the early stages should consist of splitting the periosteum for two and a half centimetres or more beyond the area of acute pain on pressure, loosening the periosteum from the bone for one and a quarter centimetres and carefully opening the medullary canal by a trephine, drill or chisel and mallet, avoiding undue jarring or trauma, but making sure that free drainage of the medulla is provided. In the very early stages no frank pus may be seen, but the marrow will be oily, serous and oedematous looking; in the acute fulminating cases with very severe general symptoms, they consider it advisable to limit the operation to laying open the soft tissues and periosteum.

Now this is almost exactly the treatment that was so insisted on by the late J. B. Murphy eight years or more ago, with the sole exception that I do not remember seeing in his writing that it was permissible to omit opening the bone in any case of acute osteo-myelitis. This is a point which is difficult to decide, but I confess that I am true to my faith and still consider that the opening of the bone, even in septicæmic cases, does good and should be practised with due care not to prolong the operation nor to be too rough. I am well aware that there are some cases considered to be acute suppurative periosteitis, which is regarded merely as a sub-periosteal abscess; the appropriate treatment in this condition is mere incision of the periosteum. Such a condition is in reality extremely rare. Murphy said that he was doubtful if he had seen five cases of acute pri-

mary suppurative periosteitis in all his experience and, of course, insists on opening the bone in all these cases, an opinion shared by most other writers, including Lejars, who says: "In practice you will act wisely, even in these milder cases, in always trephining the denuded bone." If no medullary pus is found, little harm has been accomplished, while if a medullary focus has been neglected, great harm may ensue. I can confirm these statements and I think that in almost all the cases with sub-periosteal abscesses in which the bone was not opened, was there later evidence of bone destruction, that is, of osteo-myelitis.

The further question arises: Having opened the bone and exposed the medullary cavity, are you to curette it or not? Ochsner and Crile<sup>(3)</sup> say remove the marrow with a curette and wash out the cavity with an antiseptic solution. Murphy was not in favour of anything more than providing free drainage and other writers, for instance, Pfeiffer,<sup>(2)</sup> whom I quoted earlier in this paper, advise against it. The arguments against curetting the cancellous bone and marrow are that these structures are important in combating the infection and, as it is impossible to tell where the bone has been damaged beyond repair in the early stages, we may be doing more damage than the infection and by this trauma inducing further necrosis. I think we should be content in most cases with the provision of free drainage of the medullary cavity. An antiseptic solution may be used to wash out the cavity. I have been using "Acriflavine" for some time and I leave the cavity and the greater part of the wound lightly packed with ribbon gauze soaked in "Acriflavine" solution, only inserting one or two silkworm gut sutures at either end of the incision. This packing is left in for about forty-eight hours and is then changed and the dressing done subsequently daily or more often, according to the amount of wound discharge. Otherwise the patient should receive appropriate supportive and eliminative treatment and the primary focus, if evident, should be dealt with.

In the later management of these cases there are many important problems to be considered, such as the removal of sequestra, the prevention of deformity, the treatment of joint complications, chronic sinuses and infected bone cavities. I am only too well aware of the difficulties that have to be overcome, but I do not intend to discuss these aspects of the disease, which may be considered to be osteo-myelitis in the chronic stage, except to remark that I consider that all these later troubles would be minimized and greatly simplified if the ideal of early diagnosis and immediate surgical treatment were attained. This has been done in the case of acute appendicitis to a very great extent. The profession and the public are educated to the extent of realizing that delay is extremely risky and the only reliable treatment is immediate operation in an acute attack. I think the position is much the same in the case of acute osteo-myelitis, for, although the operation in most cases cannot be claimed to be a life-saving one, it is certainly a bone-saving one and the only means of cutting down that long stay in hospital, the risk of deformity and the many

worries and expenses attached to prolonged bone sepsis.

I think the position is very aptly summed up in the conclusions of Pfeiffer:<sup>(2)</sup> "With due allowance for individual resistance and the virulence of infection, the mortality and morbidity of this disease vary inversely with the promptness of diagnosis and treatment and directly with the efficiency of drainage at the primary operation."

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- <sup>(1)</sup> Murphy, J. B.: *Surgical Clinics*, April, 1915, Volume IV, No. 2.
- <sup>(2)</sup> Pfeiffer, D. B.: "Acute Osteo-Myelitis in Children," *Archives of Pediatrics*, 1921, page 32 (abstracted in *Surgery, Gynecology and Obstetrics*, May, 1921, page 375).
- <sup>(3)</sup> Ochsner, A. J., and Crile, D. W.: "Clinical Considerations of Osteo-Myelitis," *Surgery, Gynecology and Obstetrics*, September, 1920, page 263.
- <sup>(4)</sup> Brandt, G.: *Deutsche Medizinische Wochenschrift*, July 21, 1922 (abstracted in "Epitome of Current Medical Literature," *The British Medical Journal*, October 28, 1922).
- <sup>(5)</sup> Lejars: "Chirurgie d'Urgence," 1904, page 1,070.

#### A NEW TEST FOR PANCREATIC EFFICIENCY.

##### AN AID TO THE DIAGNOSIS OF GALL BLADDER DISEASE AND CERTAIN OBSCURE DYSPEPSIAS.

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Most of us are only too familiar with the different forms of dyspepsia of which we are unable to diagnose the causes from the symptoms and the ordinary clinical examination, so that any simple test which is likely to assist us in these obscure cases is to be welcomed.

The occurrence of pancreatic disease without other lesions appears to be more common than is generally suspected. We know that pancreatic disease very often accompanies chronic gall bladder disease. The difficulty so often encountered of differentiating between that difficult trio, lesions of the gall bladder, lesions of the appendix and peptic ulcer, would be simplified if we remembered this association of gall bladder disease and chronic pancreatitis, provided we had a simple test for the latter. The elucidation of other obscure dyspepsias produced by chronic inflammation, tumours and cysts of the pancreas would also be helped by such a simple test.

The majority, if not all of the tests at present used for estimating pancreatic efficiency consist in the estimation of part only of the many activities of that organ or of some other factor. This might not give a true idea of the total function or any of the single functions of the gland, since it is possible that the different functions of the gland do not always vary in the same proportion. The tests so far devised are grouped as follows:

- (a) Tests of failure of the various external secretions affecting protein, starch or fat digestion.
- (b) Tests of failure of the internal secretions,

such as the test for diminished sugar tolerance and Loewi's adrenalin eye test.

(c) Signs of pancreatic disintegration, such as the increased urinary diastase and Cammidge's reactions.

It will be noted that no test has been devised to show defect in the production of alkali.

The test about to be described was first devised by one of us (F.L.A.) last year and has been applied in a number of cases with satisfactory results. It is a test for estimating the alkali-producing power of the pancreas, one of its most important functions and one for which no other test is used. Our work on the dyspepsias at the Melbourne Hospital leads us to believe that a knowledge of this alkali-producing function is essential in the diagnosis of certain dyspeptic cases.

To measure this alkali directly is probably impossible, but we can do so indirectly by making use of the fact that gastric acidity is normally limited by a reflux of pancreatic alkali from the duodenum, while acid introduced artificially into the stomach is neutralized in a greater or less time by this reflux.

It has been shown in a previous paper<sup>(1)</sup> that a steadily rising fractional test meal acidity curve, in the absence of any obstructive influences between duodenum and stomach (as shown by the presence of bile, for instance) indicates some defect in pancreatic alkali. The alkalinity of other juices—saliva, bile, *succus entericus*—is almost negligible. As, however, the secretion of hydrochloric acid probably differs in different individuals, it was thought that it would be better to place in the stomach a fixed standard amount of hydrochloric acid, large enough to make any secretion of gastric acid, should it occur, which is unlikely, negligible. The amount we use is 250 cubic centimetres of a 0.4% hydrochloric acid. The factors acting on this are (i.) pancreatic alkali and (ii.) the difference between the tensions in the stomach and duodenum, that of the

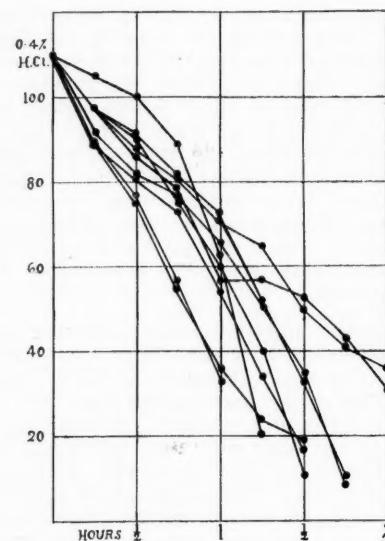


FIGURE II.  
The Hydrochloric Acid Reduction Curves of Nine Diabetics.

latter being higher on account of the stimulatory effect of the acid on the duodenal mucosa. The rate of neutralization gives a rough comparison of the rates of production of pancreatic alkali in different people, provided there is no obstruction, organic or tonic, to the normal duodenal reflux.

The test is carried out in exactly the same way as in the fractional test meal, except that the hydrochloric acid is substituted for the gruel meal. The Rehfuss tube is swallowed for a length of fifty centimetres (twenty inches), the fasting contents completely removed, the warmed acid introduced through the tube (most conveniently by means of a fifty or one hundred cubic centimetre pipette attached to the tube after filling the former with the acid) and finally five cubic centimetre samples are withdrawn by means of a large "Record" syringe (which just fits the tube) every quarter of an hour till the stomach is empty. Before the samples are withdrawn, it is well to mix the gastric contents thoroughly by alternately drawing acid into the syringe and returning it, repeating this several times. These samples are then titrated for free acid and the results plotted as a curve. Nearly always bile is present, showing the absence of obstruction in stomach or duodenum. Incidentally it was found that half or more of the subjects developed a headache within an hour or so of the test. We now give 2.6 grammes of bicarbonate of soda in water at the end of the experiment and this is quite effective in preventing headache. Figure I. shows a number of these plotted curves from healthy students. It will be seen that the range of normality is fairly wide. Figure II. shows the same curves made from a number of diabetics. The average of the latter group is only slightly above that of the former. The average age in each of the two groups was respectively twenty-three and forty-eight.

When there is pancreatic defect, the rate of neutralization becomes much reduced, giving a more nearly or even an almost horizontal curve. To test

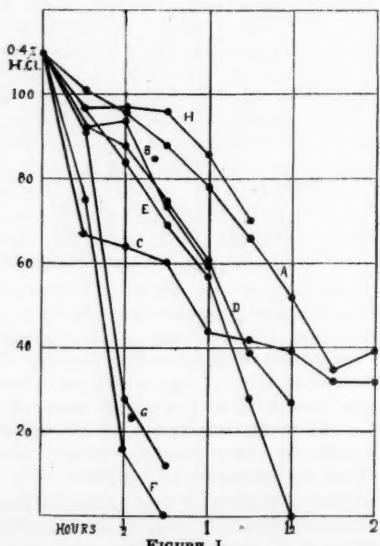


FIGURE I.  
The Hydrochloric Acid Reduction Curves of Eight Normal Men.

the above clinically we have employed the hydrochloric acid test along with certain other pancreatic tests in patients at the Melbourne Hospital and we find a remarkable agreement. One of us (G.R.C.) was responsible for the whole of the pancreatic tests, the following methods being employed: (i.) Loewi's adrenalin eye test, (ii.) the urinary diastase test and (iii.) faecal examination for undigested muscle fibre and fat.

Figure III. shows the acid reduction curves from six cases of known pancreatic defect. In two patients, Nos. 1 and 2, the clinical diagnosis was duodenal ulcer. As a result of this and the test meal we were able to return a diagnosis of pancreatic defect and at operation a pancreatitis with fat necrosis was found in both.

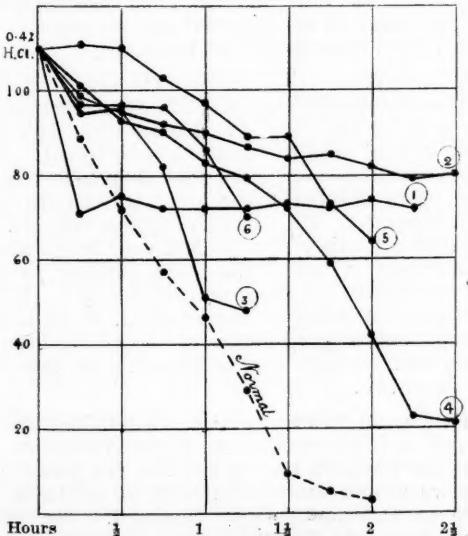
**Case 1.**—Subacute pancreatitis with fat necrosis on operation. The adrenalin eye test yielded no reaction. The urinary diastase measured 150 units. There was sugar in the urine and muscle fibres, fat and fatty acid crystals in the faeces. (Normally urinary diastase measures ten to twenty units.)

**Case 2.**—Subacute pancreatitis with fat necrosis on operation. A response was obtained to the adrenalin eye test. There were fifty units of diastase. The urine contained no abnormal constituents. Muscle fibres, fat, fatty acid and calcium oxalate crystals were discovered in the faeces.

**Case 3.**—There was no response to the adrenalin eye test. There were one hundred units of diastase. The urine did not contain any abnormal constituents. Muscle, fat and fatty acid crystals were found in the faeces.

**Case 4.**—The adrenalin eye test did not yield a reaction. There were forty units of diastase in the urine. The urine did not contain any abnormal constituents. The faeces were not examined.

**Case 5.**—There was a response to the adrenalin



Hydrochloric Acid Reduction Curves from Six Cases of Known Pancreatic Defect. The normal rate of reduction (average of thirteen healthy students) is dotted in for comparison. The numbers refer to the case above.

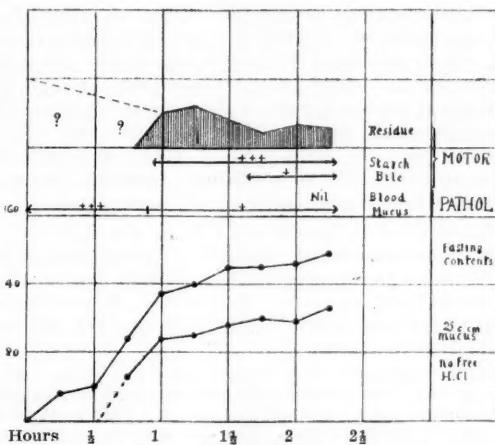


FIGURE IV.  
Illustrating a Case of Pancreatic Deficiency. The tube appears to have been embedded in mucus for samples 1, 2 and 3, hence no food withdrawn (see space marked "?").

eye test. The urine contained one hundred and fifty units of diastase. It did not contain any abnormal constituent. Fat and fatty acid were found in the faeces.

**Case 6.**—The person subjected to the tests was a healthy man, but, as his curve was high, the diastase test was made. The urine contained thirty units instead of the normal ten to twenty. It has since been found that he had, in addition, a high tone stomach, not allowing any alkaline reflux, which accounts in part for the high curve. Unfortunately the presence or absence of bile was not recorded in our notes at the time.

In no case yet, except in the presence of duodenal or pyloric obstruction, have we seen such curves in the absence of pancreatic defect. The presence of bile shows the absence of obstruction.

On the other hand, pancreatic disease with a normal test meal curve (and presumably therefore a normal hydrochloric acid reduction curve) may occur at times, provided there is sufficient pancreatic substance to supply the necessary alkali and provided the ducts are patent. Thus in one patient with carcinoma of the pancreas a normal test meal curve with the usual neutralization by pancreatic juice after one hour, was found. Inquiry from the surgeon, Mr. T. H. Boyd, elicited the following description: "Carcinoma of the middle of the pancreas, head and ducts quite free; stomach normal." It is, of course, well known that about one-quarter of most organs can produce the normal amount of secretion required for ordinary purposes.

It is not claimed that this test gives any more complete information about pancreatic function than do other tests. It is only by taking all tests together that we can obtain full information. But there is no other test which gives any information regarding that most important point, the amount of alkali available for reflux into the stomach and regulation to its acidity, the absence of which so commonly accompanies and is, we believe, the cause of the dyspepsias already referred to. All other tests depending on the external secretion of the pancreas

are for estimating deficiencies in one or other of the various enzymes. Again, it is a simple test to carry out, requiring none but simple apparatus. Its drawbacks are the length of time required—though any intelligent person can draw the samples at the stated intervals—and the fact that duodenal and pyloric stenosis give the same type of curve, but with absence of bile. These conditions, however, are as a rule readily differentiated by the symptoms.

Finally, let us quote what is in the light of the above the interesting case of a young man, aged twenty-five years, which this method has enabled us, we believe, to solve. Figure IV. shows his test meal curve and curve No. 4 in Figure III. his acid neutralization curve.

He had suffered from constipation for years. From the age of sixteen onwards he had used pills and sulphate of magnesia, but he had always felt well. He went to the war at the age of nineteen. The bad food led to acid eructations, starting immediately after food and lasting for a half to one hour, but with no discomfort. He was still constipated, but felt well and weighed seventy-six kilograms (twelve stone). He returned to Australia at the age of twenty-one in the same condition, but his weight was sixty-three kilograms. He was always hungry, but did not eat because he wanted to be thin. He was studying hard at the time. At the end of the year he weighed sixty kilograms (9 stone 7 pounds) in his clothes and felt "done in." Two years later he had distension after food with "belly rumbling" at varying times, averaging two hours after food. He was miserable, sleepy in the afternoons and had a discharging ear. This has since been cured by operation. His abdominal condition was still the same. The acid eructations then ceased and Dr. S. put him on alkaline powders, but with no benefit. He felt "out of sorts" and "done in." He suffered from boils during last year; this was later cured by vaccine. He was much improved by a holiday in Tasmania. The constipation was kept well in hand with aloes and paraffin. An X-ray examination in 1920 and 1921 showed dyschezia only; the stomach was normal.

At the time of examination there was slight fullness immediately or soon after meals. When the stomach was empty, he felt as if he wanted to belch but could not. The left epigastric region ballooned up after defecation for some time until lunch. Lunch relieved this and gave a sense of slight fullness in the mid-epigastric region, with an aching pain in the praecordial area and down to the left groin. At other times there was a feeling of fullness in every part of the abdomen. He belched very little wind, but often felt that he wanted to do so. There was much rumbling, but no flatus, except in the morning. He felt well after dinner. Exercise relieved his symptoms, unless there was over-exercise with tiredness, when symptoms were aggravated. He was not exhausted now as he was in 1921. An X-ray examination in 1922 showed an alveolar abscess which had since cleared up.

All these symptoms can be explained by the evident lack of pancreatic alkali. Unneutralized gastric contents have entered the small intestine after some delay. Free acid is known to stir up antiperistalsis and therefore these acid contents have "rumbled" to and fro for some time after meals, being only slowly neutralized by intestinal juices with the production of carbon dioxide; hence the "rumbling and distension." The acid contents in the duodenum and upper jejunum have reflexly closed the pylorus, so that alkali taken after meals produced no relief and he wanted to belch but could not. Lunch relieved this, by causing a general intestinal forward movement of the windy mass, with passage of flatus in the morning. Exercise, when moderate, relieved the rumbling by stimulating the

sympathetic nervous system, thus quietening the intestinal movement, whereas excessive exercise, by exhausting the adrenals, gave relative overplay to the para-sympathetic (vagal) nervous system, with aggravation of symptoms. The "done in" feeling was due to distension stimulating the sympathetic afferent nerve fibres, with overwork of the adrenals.

Thus this test has enabled, we believe, a complete diagnosis to be made which otherwise might not have been possible.

Our thanks are due to Dr. S. W. Patterson, Director of the Walter and Eliza Hall Institute of Research, for the use of the laboratories under his charge, and to Dr. R. H. Strong for allowing us to work in his wards at the Melbourne Hospital.

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#### TUBERCULOUS DISEASE OF THE HIP JOINT.<sup>1</sup>

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This evening I propose to speak to you about the early stages of tuberculous disease of the hip joint and to impress upon you the immense importance of early diagnosis.

#### INTRODUCTORY.

In the last ten years I find that over seven hundred children suffering from bone tuberculosis were treated as in-patients at the Royal Alexandra Hospital for Children. Of these, two hundred and ninety-four, or 41%, suffered from tuberculosis of the hip joint and one hundred and seventy-eight, or 24.8%, from tuberculosis of the spine.

In New York, according to Whitman,<sup>(5)</sup> 40% of the bone tuberculosis occurred in the spine and 30% in the hip joint. At the Boston Children's Hospital, 58% of bone tuberculosis was spinal. These figures would seem to show that they meet twice as many cases of spinal tuberculosis in America as we do in Australia. The American figures may be taken as correct, as they deal with a very large number of instances in both indoor and outdoor patients. But our figures are small and refer only to children that were admitted to the hospital, so that, until a very much larger number of cases have been collected and classified, no conclusions on this point can be drawn.

If we could follow up the seven hundred children treated as in-patients at the Royal Alexandra Hospital for Children during the last ten years, I expect we should find that nearly all of them were more or less permanently damaged. The disease comes to an end, but the joint is destroyed. A cer-

<sup>1</sup> The Presidential Address delivered at the Annual Meeting of the Section of Paediatrics of the New South Wales Branch of the British Medical Association on April 18, 1923.

tain proportion indeed never get well; they hang about hospitals for years and ultimately die as the result of prolonged suppuration. You rarely see a hospital patient discharged with a normal joint. The reason is that on admission they have nearly all arrived at the second stage of the disease. The joint, if not actually destroyed, is about to be. The skiagram nearly always shows bone destruction and if the skiagram shows this we cannot hope for complete recovery. Although this is true where joints are concerned, it is not so in tuberculosis of the spinal column. As a matter of fact, we have known children in whom tuberculous disease in the bodies of two or more vertebrae could be demonstrated clearly in a skiagram and who ultimately recovered, grew up to be healthy, athletic individuals and were apparently normal in every way.

In the early stages of hip disease—the stage when it should be diagnosed—nothing abnormal can be discovered by X-ray examination. This point cannot be too strongly made, because so many men rely on X-rays to help them in a diagnosis and an absence of abnormal skiagraphic findings means to many of them that no disease is present. But tuberculous hip disease should always be diagnosed before the skiagram shows abnormality, otherwise it is too late. Long before the X-ray picture shows the effect of tuberculous destruction on the bone or bones forming the hip joint, the clinical symptoms ought to have been quite obvious. A surgeon of experience does not generally ask for an X-ray picture of a tuberculous hip joint to aid him in a diagnosis, because, when the disease is far enough advanced to be demonstrated by a skiagram, the clinical symptoms are already quite plain. The surgeon at this stage gets a skiagram, not for diagnosis, but to show him the extent of the mischief. The progress of the disease should also be watched by means of skiagrams taken from time to time.

#### PATHOLOGY.

Whitman<sup>(5)</sup> says: "Tuberculous disease of the hip joint usually begins in several minute foci near the epiphyseal cartilage of the head of the femur. Here the circulation is most active and here the new formed bone is least resistant. Thus the bacilli carried by the blood are more often deposited at this point, where, under favouring conditions, the disease is established. These foci coalesce and an area of infected granulations replaces the normal structure. If the local resistance is sufficient, the disease may be confined to the interior of the bone, but in most instances it gradually forces its way into the joint and the granulation tissue spreading under and over the cartilage destroys it." . . .

This is probably the most common situation for the tuberculosis to be first deposited. The other situations are (*i.*) the head of the femur, (*ii.*) the acetabulum, at the junction of the segments of bone joined by the Y-shaped cartilage, (*iii.*) the neck of the femur inside or outside of the joint capsule, (*iv.*) in the epiphyseal line of the great trochanter (par-articular tuberculosis), (*v.*) in the synovial membrane.

#### DIAGNOSIS.

##### Importance of Early Diagnosis.

There can be no doubt that many people are limping about now with permanently damaged joints, following a deposit of tuberculosis in the head or neck of the femur, who should have completely recovered, because the local resistance would have been sufficient and the disease would have been confined to the bone, if only they could have been discovered while in the early stages and placed under favourable conditions for dealing with the disease.

Anybody should be able to diagnose advanced hip disease. The point on which I wish to lay stress now, is the vital importance of making every effort to recognize this disease in the very early stage, because at this stage only is there any chance of staying the disease, saving the joint and thus preventing deformity.

When the joint has become involved, the main symptoms of tuberculous hip joint disease, wherever the focus originated, are all much the same. But we know that in the early stages the symptoms may vary considerably and this is due, no doubt, to the position of the first deposit of tuberculosis. A deposit of tuberculosis in the neck of the femur outside the joint capsule or in the epiphyseal line of the great trochanter would not give rise to the same symptoms as a deposit starting in the head of the femur or in the epiphyseal line just behind the head.

Howard Marsh,<sup>(1)</sup> in dealing with diagnosis, says: "Although in advanced cases hip disease is often obvious almost at a glance, yet in its incipient stage, in which its recognition is so highly important, an accurate diagnosis is often attended with considerable difficulty. In such instances it can be arrived at, not by an appeal to two or three symptoms that are always well marked, but by taking into account and fitting together various symptoms, no one of which, if isolated from the rest, would be of any material diagnostic value."

When the tuberculous process has advanced and in its insidious manner has destroyed the joint by ripping up the cartilage and spoiling the symmetry of the head of the femur and acetabulum, there can be no difficulty in making a diagnosis. But at that stage the mischief has been done and never again will the head of the femur move smoothly in its beautifully adapted cup. Every effort, therefore, should be made to teach men to endeavour to catch tuberculous disease of the hip joint at the very early stage and treat it at once. If this were done a large number would recover without deformity or loss of function. An immense amount of suffering would be prevented, there would be fewer cripples and less drain on the invalid pension fund.

Why is it that early bone tuberculosis, of the spine as well as of the hip, is so often missed and even when suspected not seriously treated?

There are, of course, some men who rarely set themselves to work to make a diagnosis and in early hip disease, as Howard Marsh<sup>(1)</sup> says: "An accurate diagnosis is often attended with considerable difficulty."

Some men, indeed, suspect tuberculous disease and say so. They order complete rest, but the period

they recommend is quite inadequate. After a month or sometimes three weeks the child, who by this time has lost his symptoms, is allowed to run about and in a very short time the symptoms recur, when another short period of rest is ordered. And so this goes on until the disease becomes well established and there is no chance of recovery. It is hard to believe that such things happen, but I have had personal experience of it.

Then, some men suspect tuberculous disease and send the patient to the radiographer to aid them in making a diagnosis. When the "negative" result is obtained they are quite content to abandon their tentative opinion.

A large number of men put these cases of early tuberculous hip disease down to "rheumatism." Time after time this story is heard: "As soon as the child began to limp he was taken to Dr. So-and-So and was treated for 'rheumatism' for a considerable period."

Dr. J. Thompson,<sup>(2)</sup> writing on rheumatism in children, says: "Its onset may sometimes be sudden, but generally gradual. Occasionally only one joint is affected and it is well to remember that this is not rarely the hip joint."

In my experience acute rheumatic arthritis of the hip joint in children is very uncommon. It can generally be differentiated from early tuberculous of the hip by the acuteness of the symptoms, all movements at the hip joint giving pain. In doubtful cases a few doses of salicylate of soda may be tried.

It will be well to mention here some other condition that must be excluded before making a diagnosis.

In synovitis the symptoms quickly follow the injury and soon subside with rest.

In septic arthritis the onset is sudden and even in the mild forms the temperature is always raised.

In anterior polio-myelitis diagnosis is difficult only in the very early stage before the paralysis has appeared.

Pott's disease in the very early stage may be mistaken for hip disease because of the contraction of the psoas muscle, but extension only will be limited and rotation will be free.

In *coxa vara*, in fracture of the neck of the femur in childhood (traumatic *coxa vara*) and in congenital dislocation of the hip, if there is any doubt an X-ray picture will clear it up.

I have never seen Perthes's disease in the early stage. When the disease has progressed it may be mistaken for tuberculous disease of the hip, but a skiagram clears up the diagnosis at once.

Another reason why many men fail to recognize tuberculous hips or spines in the early stage is lack of knowledge or experience. The authors of textbooks do not lay stress on the early symptoms; they describe fully the well advanced disease. The students do not see patients in the early stages. The tuberculous hips and spines that they do see in the wards of the hospitals, are nearly all far advanced in their journey to crippledom.

In early hip disease, too, the symptoms are sometimes so few; the child looks so well and may not

even be lame. Men cannot believe that such a child is threatened with the dreadful but only kind of hip disease of which they have any knowledge.

#### Signs and Symptoms.

There are certain signs and symptoms on which we rely to aid us in making a diagnosis.

Howard Marsh<sup>(1)</sup> says: "It is not possible to place the different symptoms in the order of their relative value." He enumerates them thus: (i.) lameness, (ii.) pain, (iii.) abnormal position, (iv.) alteration in the length of the limb, (v.) loss of movement, (vi.) muscular movement, (vii.) swelling about the joint.

#### Limping or Lameness.

Limping or lameness is the one symptom that is most often noticed in early hip disease. It varies much with the situation and extent of the disease and often after a short rest may be entirely absent. It is due very often to the child attempting to hold the limb in certain positions. For instance, should the tuberculous focus be close to the lower part of the head of the femur, if the limb be held in abduction, this part of the femur will be prevented from coming in contact with the acetabulum. On the other hand, should the focus be near the upper border of the head, the tendency would be to keep the limb adducted and so prevent pressure on the tender spot.

#### Pain.

Pain in hip joint disease is an uncertain quantity. It may be entirely absent from the beginning and even when the disease is well advanced. Edmund Owen<sup>(3)</sup> says: "Pain in the hip joint disease is apt, like the cry of the plover, to decoy one from the object of the search. At the beginning of the trouble it is often located at the knee."

It is well known that for generations medical men have been deceived in this way and at the present day it is not uncommon to come across a child suffering from tuberculous hip disease whose knee has been assiduously "treated" for many weeks.

#### Alteration in Length.

Any real alteration in the length of the limb is non-existent in early hip disease. Shortening only occurs in the later stages, when the head or neck has been absorbed. There is never any real lengthening. Apparent lengthening is due to the limb being kept in an abducted position.

#### Muscular Wasting.

Muscular wasting is an early and important symptom and is constantly present in early tuberculous hip disease. It is important because it is a symptom that sometimes helps to weigh down the balance when we are confronted with a doubtful case. Although it is always present in tuberculosis of the hip, we must remember that it is not pathognomonic of this disease and may be due to other causes, such as disease of the lumbar vertebrae and sacrum and to infantile paralysis.

Edmund Owen<sup>(3)</sup> says: "Muscular atrophy is an early and characteristic sign of joint disease. The muscles, the bones and the joint are all under the

nutritive care of nerves coming out from the anterior cornu of the grey crescent of the cord and when the joint is in trouble Nature inhibits the free supply of nutritive fluid to the bones and muscles so as to secure rest for the articulation. Thus it is that the muscles quickly begin to waste. It is often suggested that the wasting of the limb in joint disease is merely the result of want of use. But that is not the correct explanation of the phenomenon, for if a child has hip joint disease, say, on the left side, and he is fixed in a double Thomas splint or some other apparatus which prevents his using either limb, the sound limb wastes but very little, at any rate not nearly to such an extent as does the limb on the affected side."

In definite instances the wasting can be seen quite plainly and is often observed in the flattening of the gluteal fold from wasting of the glutei.

When the muscle wasting is slight, as it is often in the early stages, it is not always easy to determine its presence. To take measurements I generally use narrow strips of zinc oxide plaster. This material can be placed evenly on the limb and does not slip. But this means 0.3 or 0.6 centimetre (one-eighth or one-quarter inch) of wasting can easily be demonstrated.

#### *Swelling.*

In tuberculosis of most joints, such as the knee, ankle, elbow, wrist, swelling is an early and prominent symptom, but it is not so in hip disease. When it is found in tuberculous hip disease it is always a grave symptom, because it generally indicates that the soft parts outside the capsule have been invaded.

#### *Methods of Examination.*

A child with early tuberculous hip disease is nearly always brought to you for some definite reason. Before bringing the child to the doctor, the parents will have noticed something wrong. The child will have been noticed to be limping or will have complained of pain in the hip or knee or perhaps only complained of feeling tired. You must find out by questioning exactly what has been noticed. Mothers are very good observers where their children are concerned. After that you proceed to examine the child in order to see if you can detect any signs, however slight, that may vary from the normal. Do not rush the child. Always before you begin your examination of him, try to gain his confidence. When this is done, get him undressed.

First observe how he stands, then make him walk up and down the room. If he limps decidedly you will probably notice that the limping is due to his trying to keep his thigh in a slightly flexed position. You have now gained an important fact. Your diagnosis is not made, because you have to make sure that the position of the limb is not due to some extra-articular trouble. The child must now be examined lying down on a couch. Notice, when both thighs are touching the couch, whether there is any lordosis (the amount of flexion can be found out by raising the limb until the spine becomes straight).

If the iliac spine is too low on the suspected side,

there is abduction; if it is too high, the leg will be adducted.

Always examine the sound leg first, putting it slowly through all its natural ranges. When you examine the affected side you may find it fixed, that is to say, the child will not permit any movement at the joint. But this is quite uncommon in early stages, generally the movements are fairly free and are only restricted in certain directions. Sometimes the child will permit you to flex freely, but resents flexion with adduction.

All the movements are to be gone through and a careful note should be made of any restriction or limitation of movement.

But restriction or limitation of movement alone is not a certain indication that the trouble is in the joint. It is an indication only that there is something preventing a normal painless movement of the thigh on the body. We have a further test in rotation. If rotation is limited we may strongly suspect that the joint is affected, even if the other movements are free.

According to Marsh:<sup>(1)</sup> "If rotation is perfectly free it goes far to negative the presence of disease."

#### *Consideration of Facts.*

We have now to marshal our facts. First we have the history—the reasons given by the parents for bringing the child—and these generally are pain somewhere in the leg and limping. As a rule there has been no acute onset, the symptoms have generally come on gradually. Then on examination, even if there is no lameness, we have probably found limitation of movement at the hip joint and especially of rotation. Added to that, on measuring the limbs, we find a certain amount (it may be very slight) of muscle wasting. With these facts before us, if we can exclude other extra-articular causes likely to give rise to the symptoms, then we must suspect early tuberculous hip disease.

Generally there is not the slightest difficulty in coming to a decision. But there are instances in which there is room for doubt and then you hesitate before ordering prolonged rest. You do not care to condemn a child to bed for six months if there is no necessity. If you are doubtful (especially if the child has been resting just before your examination) you tell the parents to let the child run about as usual for a week and have him brought to you for re-examination at the end of that time. Then, if the trouble has been due to a deposit of tuberculosis you will almost certainly find some symptoms, such as impaired movement, and possibly other signs that indicate plainly commencing disease. In that case your duty is clear. On the other hand, supposing that after this week of running about there are no symptoms at all, there is no lameness or pain, there is no restriction of movement and rotation is free, you would not be justified in ordering rest. The child must resume its normal life, but the parents must be told to watch for symptoms and to consult a doctor at once if there is any recurrence.

#### *TREATMENT.*

When you have made up your mind that you are dealing with a deposit of tuberculosis somewhere in

the hip joint, you must impress upon the parents the seriousness of the trouble. If the disease is not arrested, it means that the child will be lame, probably very lame, all its life.

Tubby<sup>(4)</sup> says: "Too little attention has been paid to general treatment" and he quotes H. P. N. Galloway, who said: "The surgeon's first duty is to realize that he is being consulted by a patient who has tuberculosis."

We should not expect a patient suffering from phthisis to make much headway, if we fixed him in bed in the ward of a city hospital. Children suffering from tuberculous hip disease need open-air treatment. They should be placed on the best verandah in the house in a cot or on a couch and where there is a garden they should, if possible, be carried out each day. They must be properly fed and amused.

The local treatment in children suffering from the disease in the very early stages is very simple. They must be kept in bed and on no account must they be allowed to stand or kneel; no apparatus or fixation is necessary. The child can lie in bed in any position that is most comfortable. He can be propped up for his meals. As the treatment is so very simple, most of these children can be treated at home. Here, given good healthy surroundings, they have a better chance of overcoming their disease than in the wards of a hospital. The great difficulty we have to contend with, is making people understand the importance of carrying out these simple instructions. With the more educated people this can generally be done and they easily realize the issues at stake and will do what they are told; but there are people (we all know them) who will not. Under such circumstances it is quite useless giving instructions that you know will never be carried out. So, if the child is to remain at home, you must arrange for some splint or apparatus that will keep him still or you must send him to a hospital.

If there is any abnormal position, this must be treated by weight extension, so arranged that the pull at first is in the direction of the deformity. If the child suffers from night starts, weights are necessary. The amount of weight depends upon the size and age of the child. In a child between four and five years old you might begin with 1.35 kilograms (three pounds) and gradually increase the weight until the night starts are controlled (and in the early stages they are generally controlled with ease). After an absence of night starts for fourteen days gradually begin to diminish the weights. In most instances in a very short time they can be left off.

Nearly always when weights have to be applied, it is necessary, until the deformity is corrected or the night starts have come to an end, to have the child in a hospital. But later on, when the weights can be left off, some children, if the parents are at all sensible, can be sent home in a Jones's frame and put out on the verandah some time before they are fit for the application of a walking Thomas's splint.

How long must rest be maintained in these early stages? This is always a difficult question to

answer. No two patients are exactly alike and each child must be dealt with according to its condition. Everything has to be taken into consideration before coming to a decision on this point, the story that has been told you, the symptoms you have yourself discovered, the type of child. The very delicate looking child, with long, curly lashes and possibly a bad family history is not likely to have as much resisting power against the tubercle bacillus as one not bearing such stigmata.

If you have to fix a period of rest, even in the mildest type of the disease, *id est*, a fairly healthy looking child with very few symptoms, you must say four months at least. That the child will be allowed to be about again at the end of that time, is contingent with and depends upon the absence of all symptoms when it is re-examined. Then when the child is allowed to get about it must do so gradually. Any recurrence of symptoms coming on soon (a few weeks) after it has been allowed to be up and about, would necessitate a much longer period of rest than you had originally prescribed.

Children that have shown quite definite symptoms, such as abnormal positions and night starts should after the weight extension has been removed, be kept in a splint or Jones's frame for some months; then perhaps they may be allowed to get about on a walking Thomas's splint. They should not, however, bear weight on the affected side for under twelve months from the time the weight is left off.

With children in early stages treated by rest in bed in the open air with plenty of sunshine, you may expect a large percentage of good results.

But we know that some few children get progressively worse, even if taken in hand and treated on the right lines from the beginning. They cannot resist the disease, which goes ahead in spite of all we do.

Some people imagine that if a tuberculous joint is fixed and immobilized in the very early stages that the disease must stop. But it is not so.

We have seen children in hospital fixed in, say, a double Hamilton's splint for months for the treatment of tuberculous disease of one hip joint develop the disease in the other while they are lying still.

As I have just said, in many children in the very early stages, when there is no pain and no deformity and the limping passes off after a short rest, I do not think it is necessary or right to apply splints or fix the child in the bed. The child must stay in bed. There must be no standing or kneeling.

I wish to lay stress on this point of non-fixation, because it is where I differ from most authorities. All the authors of text-books say the joint must be fixed. But why, in these early stages? Our object surely is to improve the child's general health to enable him to deal with the small tuberculous focus (deposited possibly somewhere in the neck or head of the femur) which has not as yet damaged the cartilage.

And can anyone doubt that the child whose limbs are free in bed, is much more likely to gain in health than the one who is stretched all day in an unnatural position on a splint?

## CONCLUSION.

In this paper I have intentionally restricted myself to the consideration of one phase only of hip joint disease. I have shown you that recognition in the early stage is of vast importance, because this is the only stage in which there is any chance of saving the joint. And yet it is a stage of the disease that the authors of text-books neglect and the average practitioner knows very little about.

The treatment of well-established hip disease in all its diverse forms by the various methods now in use is very interesting and opens up a wide field for discussion on many points, but, as Kipling says, "that's another story."

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## Reports of Cases.

RECURRENT SUBLUXATION OF THE HIP OF TRAUMATIC ORIGIN.<sup>1</sup>

BY A. V. MEEHAN, M.B. (SYDNEY), F.R.C.S. (EDINBURGH),  
Brisbane.

A.T., a soldier, was kicked by a mule while on the march in France in November, 1917. The mule's hoof struck the front of the upper part of the left thigh very forcibly and the man was knocked down. He was carried on a wagon and did not receive medical attention for nearly a week. The thigh swelled greatly and was severely bruised. He was admitted to hospital after about a week and hot foment and rest in bed were ordered. He was allowed to walk in about a month and noticed at once that when he put weight on the injured limb the hip "went out of joint." This condition has persisted ever since, but, on arriving in Australia, he was fitted with a moulded leather corset, fitting the pelvis closely and embracing the upper third of the injured thigh.

This simple appliance completely controls the condition and enables him to carry on the work of a storeman. On removing the splint it is noticed that there is no perceptible wasting of the limb, no restriction of movement at the hip joint and no pain on movement.

When the patient puts his weight on the left leg, the great trochanter is seen to roll upwards, backwards and outwards beneath the *gluteus maximus*. When he takes his weight off the leg, the great trochanter resumes its normal position. As he walks without the splint, the gait resembles that of a patient with a congenital dislocation of the hip.

Whilst lying on his back the patient can, by slightly flexing the thigh and rotating it inwards, reproduce the condition seen whilst standing; a careful tape measurement before and after displacement is produced reveals that the limb is shortened by 2.22 centimetres (seven-eighths of an inch) during the displacement.

The case is one of recurrent subluxation of the hip joint, amounting almost to complete dislocation, of traumatic origin.

I think that a complete recovery could be looked for

from plication of the posterior part of the capsule of the hip joint, but, as his appliance completely controls the condition, he is not anxious to be operated upon.

## RESISTANT SYPHILIS CONTROLLED BY BISMUTH INJECTIONS.

By E. H. MOLESWORTH, M.B. (SYDNEY),  
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Sydney.

I AM reporting the following case on several different grounds. In the first place, although undoubtedly syphilitic, the patient's serum has never reacted to the Wassermann test. The condition was diagnosed as syphilis by Dr. Ellis, who handed the patient on to me, and I concurred in the diagnosis. He was seen in consultation with Dr. McMurray, who also concurred. He was seen by Dr. Dawson, who agreed with the diagnosis. The patient has displayed numerous lesions all compatible with and nearly all typical of syphilis.

In the second place, the case is interesting because of the extraordinary resistance to the treatment, mercurial and arsenical.

In the third place, it is the earliest or at any rate one of the earliest cases treated in Australia with the new bismuth spirillicide, "Trépol" (tarro-bismuthate of soda and potash) and shows very beneficial results as compared with "606."

Mr. J.C., *atatis* twenty-five years, was first seen in consultation on June 3, 1921. He complained of soreness of the tongue that had been present for four weeks. A solid infiltration of the tongue was seen occupying a shilling-sized area; it was eroded. The sub-maxillary glands were greatly enlarged and there was a general lymphadenitis. A papular rash was present. The Wassermann test failed to yield a reaction on two occasions. Dr. Ellis reports that there has been no improvement after three doses of arseno-benzol (0.6 grammes each) and one dose of five cubic centimetres of "Intramine."

The diagnosis made was secondary syphilis with primary infection on the tongue (in spite of the absence of a Wassermann reaction).

Intensive treatment with arseno-benzol given intravenously and mercurial cream applied intramuscularly was instituted and continued for a month. Some of the lesions disappeared, but others appeared in spite of treatment. The intramuscular injection of mercury was then abandoned in favour of the intravenous injection of colloidal mercury (two cubic centimetres of a 1% suspension twice weekly), with an intermission of one month, during which two doses of five cubic centimetres each of "Intramine" and two doses of ten centimetres each of colloidal iodine were administered. Meantime the arseno-benzol was replaced by "Diarsenol" with improved effect, but the arsenic administration had to be kept up at almost regular weekly intervals (nine injections in twelve weeks). Even Query's serum was tried, but it was apparently quite incapable of even controlling the existing lesions.

Then three doses of "Disodo-Luargol" (0.1, 0.15 and 0.20 grammes) were given in the thirteenth week, but new lesions appeared.

Then on September 21, 1921, the patient was seen in consultation with Dr. McMurray, who urged intensive treatment by inunction of mercury and the omission of the arsenic derivatives. This was done, but the disease went ahead so rapidly that at the end of four weeks the arsenical treatment had to be resumed to keep the disease in check.

From this time onwards for a few weeks Dr. Dawson in my absence carried out the weekly injections of arsenic and "Nov-arseno-benzol" was used instead of the arseno-benzol.

After two months' intensive inunction this method was intermitted, but three cubic centimetres of *liquor hydrar-*

<sup>1</sup> Read at a meeting of the Queensland Branch of the British Medical Association on March 2, 1923.

*gyri perchloridi*, with 0.75 grammes of iodide of potash, were administered in a mixture three times daily.

From this time (December, 1921) until December, 1922, twenty-two more injections of "Nov-arseno-benzol" or "Neodiarsenol" were given, together with five injections of "Hectine" (0.1, 0.1, 0.1, 0.2, 0.2 grammes) and intramuscular injections of mercury and "Argulan," which the patient finally and resolutely refused to continue. He was put back on to the mixture of *liquor hydrargyri perchloridi* and iodide of potash, which really seemed to do more good than the other methods of mercurial administration. But during the whole time, although lesions healed, fresh batches kept coming out, especially if longer than a fortnight was allowed to elapse between arsenic injections.

The patient, however, continued in fairly good health and was able to work while under intensive treatment, but any attempt to intermit the medication, especially that of the arsenical variety, resulted in the formation of fulminant lesions, which could then only be induced to heal by a course of weekly injections of one of the arsenic derivatives. "Intramine," colloidal iodine, "Hectine" and "Argulan" were apparently quite useless and only allowed malignant looking lesions to develop during their administration.

Even on December 21, 1922, after a fortnight's intermission of "Nov-arseno-benzol" treatment, my note is: "Fresh papular lesions have appeared and another dose of 'Nov-arseno-benzol' was administered."

On January 6, 1923, he began his intramuscular "Trépol" injections (two cubic centimetres).

On January 13, 1923, he received three cubic centimetres of "Trépol."

On January 23, 1923, he received three cubic centimetres of "Trépol." Note: "The lesions were almost entirely clear."

On January 29, 1923, he received three cubic centimetres of "Trépol."

On February 12, 1923, he received three cubic centimetres of "Trépol." Note: "Clear of all lesions."

On March 3, 1923, he received three cubic centimetres of "Trépol."

At this point the patient had to leave for the country for two months, but promised to return immediately if any lesions whatsoever developed, a contingency which has fortunately not developed. This is the first time that an intermission of treatment for more than two weeks has not resulted in a violent outbreak.

The extraordinary tolerance of the patient for the arsenic derivatives and the extraordinary resistance of this particular infection to those drugs may be judged by considering that in a period of eighteen months there were administered: Of arsено-benzol or "Diarsenol," eleven injections (6.40 grammes); "Nov-arseno-benzol," "Neodiarsenol" and "Neosalvarsan" (German), twenty-four injections (14.70 grammes); "Disodo-Luargol," three injections (0.35 gramme); "Hectine," four injections (0.60 gramme), making a total amount of arsenic derivatives of 22.05 grammes.

In addition to the above arsenical drugs the patient had: Mercury (intramuscular), twenty injections (1.50 gramme); 1% mercury colloid (intravenous), seven injections (14 cubic centimetres); mercury by inunction for two months; mercury by mouth for many months; iodine (coloidal), two injections (20 cubic centimetres); iodine by mouth in combination with mercury; "Intramine," three injections of five cubic centimetres each (fifteen cubic centimetres).

This is by far the most resistant syphilitic infection that I have met and this the man most tolerant of arseno-benzol drugs.

In my opinion the persistent absence of a Wassermann reaction is probably associated with a low degree of personal resistance, which in turn seems to be associated with failure to produce those substances which in the serum of an infected person produce a Wassermann reaction.

As showing the undoubted value of the bismuth preparations which removed and have kept clear for eight

weeks lesions which invariably recurred after a fortnight's intermission of the arsenic derivatives, it is an illuminating though, of course, not a conclusive case.

## Reviews.

### THE ALLEGED REJUVENATING EFFECTS OF ENGRAFTED TESTICULAR SUBSTANCE.

DR. VORONOFF's monograph<sup>1</sup> is a record of experimental work on testicular grafting carried out by him in Paris, at the Department of Experimental Surgery of the Collège de France. In a brief introduction the author insists on the necessity of withholding final judgement of the results of experiments of this nature until sufficient time has elapsed for long-continued observations to have been carried out.

His observations cover a large series of animal experiments which have been performed by himself in his laboratory from June, 1917, until the latter part of 1922.

In the first case described the testis of a young man was grafted into the subcutaneous tissues of a ram aged three months. This graft underwent absorption, so that at the end of six months a fresh sub-peritoneal graft was made. The result recorded was stunted growth of the ewe, with premature ossification of the epiphyseal cartilages.

In the case of a young female goat in which testicular grafting was performed subsequently to oophorectomy, the animal is said to have acquired horns and general attributes approximating the male type. The effects of testicular grafting in young male goats and rams, the animals having been previously castrated, are next described. It is stated that these animals developed male characteristics, strong horns, male stature, whereas castrated control animals failed to do so.

Pathological evidence is adduced to show that, though the engrafted tissue underwent well-defined histological change, the internal secretory activity remained. The author next describes the effects observed after the grafting of testicular tissue from young rams on to the testes of old, worn-out rams. It is claimed that a truly remarkable re-juvenating effect was observed, particularly the return of the sexual activity and reproductive powers, which had previously declined to such an extent that the animals had been regarded as worn out and quite useless for propagation.

Testicular grafts in the human subject are next dealt with in detail. As the author found it almost impossible to obtain human testicles for this purpose, recourse was had to the testicles of monkeys. Eight cases of human testicular grafting are described, the most remarkable of which related to a man of seventy-three years, who is said to have changed from a condition of senile asthenia to a vigorous and healthy state, as though the individual had been re-juvenated by twenty years or more! The operative technique is described in detail, the testicular substance being attached to the testis of the patient in several separate grafts, placed within the *tunica vaginalis* and attached by catgut sutures.

The remainder of the book is devoted to a discussion of the origin of the testicular hormone, the author supporting the views of Professor Retterer, who maintains that the seminiferous tubules of the testis possess the dual functions of producing an internal as well as an external secretion and that the function of the interstitial tissues is purely nutritive and not related directly to the production of the testicular hormone.

The book contains numerous illustrations of the animals and a human patient subjected to testicular grafting and appears to be an accurate record of prolonged observation and careful experiment in an interesting field of investigation.

<sup>1</sup> "Greffes Testiculaires," par le Docteur Serge Voronoff; 1922. Paris: Librairie Octave Doin; Royal 8vo., paper cover, pp. 83, with 19 plates.

# The Medical Journal of Australia

SATURDAY, MAY 12, 1923.

## Women Doctors.

IN February of this year the Federal Committee of the British Medical Association in Australia passed a resolution at the instance of the New South Wales Branch to the effect that the remuneration of medical officers in the Commonwealth and State medical services should be the same for men and for women, provided that the work undertaken be the same. Three years and a half ago there was occasion to call attention in these columns to the resistance still offered to the woman doctor in her claim for equality with men within the profession. Time and circumstances have combined to compel the opposing forces to yield to the claims of the educated and intelligent woman in public life. The conservative elements in England and Scotland have struggled long against the inevitable. One after another the licensing bodies have abandoned the ridiculous policy of a differential treatment of the two sexes. In Australia women students compete on equal terms with men in the medical schools and there is ample evidence of success on the part of individuals of both sexes. In practice women are required to recognize the same ethical rules and to conduct their practices in exactly the same manner as men. The fees charged by women in general or special practice in England in the old days were materially lower than those charged for the same class of work by men. Later, when the British Medical Association adopted the principle that women practitioners should enjoy the same privileges and suffer the same pains and penalties in their professional capacities as men, the tendency to charge smaller fees and to accept lower salaries gradually disappeared. In 1907 the Representative Body established the policy that the pay of salaried medical practitioners should be the same for women as for men. This policy was confirmed in 1914. The resolution of the Federal Committee

thus becomes merely the adoption of the policy accepted in the United Kingdom sixteen years ago.

It has been pointed out that women workers in other walks of life do not receive the same remuneration as men, even when exactly the same work is performed. One reason given for the differentiation is that in a very large number of instances the man has a wife and family dependent on him, whereas the woman usually has no actual dependants. If the world were planned on a strictly logical scheme, this excuse might be regarded as valid. The real reason why women in industry and in some professions receive less than men for the same kind of work is that they have not adopted the expedient of collective bargaining. If a governmental department deals with an individual a hard bargain is the usual result. Equitable conditions of service are rarely offered; they have to be demanded. And the isolated individual is helpless in enforcing his or her demands. By uniform action and a concerted determination to refuse inadequate remuneration the employer is forced to yield. The tendency to-day is to grant reasonable demands of all workers, at all events of all male workers. To-morrow women will come into their own. Employers will be compelled to realize that remuneration must be measured by the value of the services rendered, not by an assumed requirement of the individual. If wages were to be adjusted to the financial obligations of the employee, the system would be so complicated and so open to abuse that employers would be compelled to select their workers, not for their skill and knowledge, but for the number of persons they had to support.

It is still held by some men that the employer, be he a government department or an individual, would engage men in preference to women in all cases if there were no distinction between the rates of pay. It may be so. But if this be true, the employer has still to learn that in his own interests he should engage the individual best equipped for the service. Every person with experience of the world knows that a clever woman is invaluable in many industrial undertakings and that in some positions they excel. There are clever women and stupid women, just as there are clever men and stupid men. Women have achieved fame in many

handicrafts and have left the average man far behind. In medicine women have revealed aptitude of no mean order and in special instances have demonstrated their ability to occupy leading positions. As teachers, as surgeons, as physicians, as bacteriologists, as physiologists, as medical officers in industrial concerns, as medical officers in school medical services and in the public health services many women have accomplished much and have won recognition and esteem. There have been great pioneers among women doctors, women who have made immense sacrifices for an ideal and have attained their goal through sheer force of character, expert knowledge and unflinching determination to succeed. The battle against prejudice will not be won by the passing of resolutions or the establishing of principles. Unity of purpose and combined action are the weapons that must now be employed. Armed in this way the medical women of Australia will have little difficulty in breaking down the last remnants of the sex barrier which has impeded them for so long.

### Current Comment.

#### SPRUCE.

THE name sprue applied to that most dangerous and complex condition which affects the intestinal tract, is taken from the Dutch word *spruw*. Sprue is very prevalent in Java and indeed in many other tropically situated countries, including Northern Queensland and Western Australia. Its geographical distribution is by no means, however, limited to the tropics. Instances are frequently encountered in non-tropical localities, such as Northern China and Japan. It is for this reason that exception has been taken to the term tropical as applied to the disease. At first sight it would appear that the recognition of the disease is a matter of simplicity, so typical are the copious, frothy, fermenting stools, so constant is the bare, eroded condition of the mouth and tongue and so pronounced is the wasting. There are other conditions which may simulate sprue very closely, conditions such as dysentery and "hill diarrhoea" in patients who have become exhausted by continued exposure to unfavourable conditions of life. The determination of the cause of sprue or, as many prefer to call it, psilosis is a matter of great difficulty. One reason for this difficulty has been the fact that, although residence in tropical or sub-tropical localities is most probably a factor, symptoms of the disease have only appeared in some individuals many months after their return to temperate climates.

Many hypotheses of causation have been advanced. Climate, diet deficiencies, bacterial infections and infections by yeasts have in turn been investigated in this regard. The last named infection alone would appear to be actually connected with the disease. Bahr, as a result of his work on this disease in Ceylon, held that there was no evidence in favour of regarding the sprue yeast as being otherwise than identical with the thrush fungus, *Monilia albicans*. This is an organism of low pathogenic power. Bahr thought that it was quite possible that under certain unknown conditions peculiar to the tropics this pathogenic power might become greatly augmented. Bovaird, writing in 1921, pointed out that if Bahr's conclusions were correct, it would indicate that infantile sprue or thrush and psilosis (tropical sprue) were produced by the same organism and were therefore one and the same disease. He regarded this as quite impossible, since there was no resemblance between the mouth lesions in the two conditions.

Ashford, working in Porto Rico in 1914, found a yeast which he held to be common in psilosis. He insisted, however, that it was not *Monilia albicans*, but that it was a hitherto unrecognized species. He has styled this fungus *Monilia psilosis*. Bahr's experiments in feeding monilia to animals proved the yeast to be harmless, but Ashford observed a stomatitis in animals to whom he fed *Monilia psilosis*. In several instances he produced a protracted diarrhea. Bovaird in 1921 asserted that in his opinion the *Monilia psilosis* was not the causative agent in sprue, but that it must be regarded as a chance invader. He based this assertion on the results he had obtained from the examinations made in regard to thirteen patients suffering from sprue. In only one instance was he able to find the monilia. Looking back on this work, it must be recognized that the numbers examined by Bovaird were very small for the determination of such a problem.

Dr. Bailey K. Ashford has recently published a further contribution to the subject of sprue in the results of a clinical investigation made at the Institute of Tropical Medicine and Hygiene at San Juan, Porto Rico.<sup>1</sup> Dr. Ashford states that the two factors concerned in the production of the sprue complex are on the one hand a glandular insufficiency and on the other hand the superimposition in the digestive tract of a specific organism, the *Monilia psilosis*. The true clinical picture known as sprue is due to this organism. He enumerates the causes which may produce physiological glandular insufficiency and states that they may produce such symptoms as asthenia, acid dyspepsia, excess of intestinal gas, constipation with or without occasional attacks of indigestion and "loose bowels," reduction in the size of the liver, loss of appetite and weight, nervousness with depression, sleeplessness and mental habitude, pallor, disorders of menstruation and pigmentation of the skin. He states that in this preliminary condition of glandular insufficiency the *Monilia psilosis* cannot be demonstrated. With the development of the sore tongue and the

<sup>1</sup> *The American Journal of the Medical Sciences*. February, 1923.

access of the large white, frothy stools, however, its presence can usually be shown. Dr. Ashford states that the clinical diagnosis is often impossible without a positive laboratory finding in patients whose clinical picture is on the border-line between incomplete sprue and the syndrome of glandular insufficiency. This often becomes more difficult on account of the presence of subjective burning of the tongue, which may be present in both conditions. Dr. Ashford has tabulated the symptoms observed in six hundred and sixteen patients suffering from sprue and in two hundred and fifty-nine patients whose condition was diagnosed as being due to glandular insufficiency. The only symptoms that were not common to both groups in some degree or other were the raw tongue and the copious frothy stools. Subjective burning of the tongue without demonstrable lesion thereof was present in 17% of patients with glandular insufficiency and in 37% of those with genuine sprue. Burning of the tongue with evident lesions on the tip or edges, ranging from redness to excoriation, was present in 2% of those with glandular insufficiency and in 20% of those with genuine sprue. Laboratory investigations were carried out in regard to four hundred and fifty-three of the six hundred and sixteen patients suffering from sprue. The investigation consisted in the examination of the faeces for the *Monilia psilosis*. The faeces were examined once only, save in nine instances. In eighty-eight instances the complement deviation test was applied to the patient's serum. This evidence of the affection was obtained in connexion with twenty patients from whose stools *Monilia psilosis* had not been isolated. By these two methods 85% of the four hundred and fifty-three patients were shown to harbour the monilia. Of two hundred and fifty-three patients held to be suffering from glandular insufficiency one hundred and twenty-four had the benefit of laboratory investigation. In no instance was *Monilia psilosis* found. Dr. Ashford points out that if the examination of the faeces had been carried out on more than one occasion, the specific yeast would have been found in a greater percentage. He also states that it would have been possible to have found the monilia in the stools of some of the patients with glandular insufficiency, for he holds that the monilia may pass through the intestinal canal as a *voyageur* without colonizing. He refers to the fact that it has been shown that at most 1.5% of all individuals living in endemic zones have been shown to harbour the *Monilia psilosis*.

This work of Dr. Ashford's is most important and valuable. While it must be admitted that the portion of his research dealing with glandular insufficiency cannot be regarded as proven, the confirmation by other workers of the identity of the *Monilia psilosis* will do much to lift sprue out of the ruck of diseases that are little understood.

#### COELIAC DISEASE.

SINCE Samuel Gee in 1888 described as a clinical entity the condition known as coeliac disease, several noteworthy contributions have been made to the

literature on the subject, but definite finality has not been reached as to its nature. The clinical syndrome characterized by wasting of the patient, distension of the abdomen and the passage of copious, watery, foul stools with an increased fat content is well known. Gee regarded the disease as being identical with sprue and Poynton, Armstrong and Nabarro have suggested that coeliac disease may occasionally be the forerunner of Hirschsprung's disease. They did not regard coeliac disease as a specific entity, but thought that the symptoms characteristic of the coeliac condition were possibly grafted on to a peculiar condition whose nature they did not define. In regard to the similarity of coeliac disease to sprue, Still was probably right when he said that the identity of these two disorders could not be affirmed until a specific cause common to both had been established.

There are two main views as to the causation of the disease. The first may be regarded as the bacteriological theory, while, according to the other view, the disease is due to some profound digestive disturbance. Thus Herter held that several organisms were associated with the disease and Still isolated dysentery bacilli from the stools of six patients in a series of eleven. The serum of some of his patients agglutinated this bacillus. He admitted, however, that the findings were inconclusive. Those who have approached the question from the other point of view, draw attention to the failure of fat absorption. The percentage of fat in the stools is greatly increased. The pallor of the stools is not due to the complete absence of bile as Cheadle thought. Cammidge certainly found slight bile deficiency in the stools of some of Still's patients, but, as Still has pointed out, the colour is largely due to the presence of undigested milk fat. On the question of pancreatic insufficiency there appears to be considerable doubt. Gibbons suggested it as a factor, but Still was unable to find any conclusive evidence of this among his patients. He was driven to the conclusion that the fault lay in a failure of the absorptive power of the mucosa of the small intestine. He thought that the first step in the process might well be a catarrhal condition of the small intestine.

Dr. Rood Taylor has reported the results of his investigations of seven patients suffering from coeliac disease.<sup>1</sup> His findings lend support to the view of causation by digestive disturbance. In all seven children affected, the onset was preceded by a long period of bad feeding and most of the patients had been forced to adopt a protein and fat diet on account of definite carbo-hydrate intolerance. Several had sustained a parenteral infection. Gastric achlorhydria was present in the five patients whose gastric contents were examined. The liver was small in every instance. In one patient the condition was complicated by the presence of Banti's disease, in another leucin and tyrosin were present in the urine and in a third the duodenal juice contained an abnormal pigment.

<sup>1</sup> *The American Journal of Diseases of Children*, January, 1923.

## Abstracts from Current Medical Literature.

### BACTERIOLOGY AND IMMUNOLOGY.

#### The Desiccation of Serum for Use in the Wassermann Reaction.

P. HARTLEY, A. J. EAGLETON AND C. C. OKELL (*The Journal of Pathology and Bacteriology*, January, 1923) describe experiments undertaken with a view to the preparation of serum reagents used in the Wassermann reaction in a stable form for use under conditions which render difficult the obtaining and preservation of these substances. A detailed description of the method (Martin's) employed for the desiccation of serum is given and by its use diphtheria antitoxin, tetanus antitoxin, anti-dysentery serum, solutions of albumin and globulin prepared from normal and immune serum, haemolysin, normal human serum and human serum reacting positively in the Wassermann reaction have all been successfully reduced to the dry condition. The dried products obtained can be dissolved by the addition of the correct amount of water and the solution thus obtained behaves like the original fluid serum. Haemolysin prepared by the injection of sheep's corpuscles into horses has been desiccated on many occasions with uniform success. Parallel tests have been carried out with cells sensitized with liquid haemolysin and with the equivalent amount of dried serum dissolved in saline solution and identical results have been obtained, both in complement and antigen titrations and in the Wassermann reaction. Some samples of dried haemolysin stored at room temperature for twelve months were found to have retained their activity and specific properties unchanged; samples stored at 37° C. were found to have greatly deteriorated. In complement titrations it was found that if the haemolysin had lost potency during the process of desiccation the same end point was reached as when fluid haemolysin of comparable strength is employed, but there was some reduction in the rate of the reaction. Human serum, reacting positively to the Wassermann test, was found not to have lost any of its specific properties after desiccation. A serum dried six years previously gave a strongly positive reaction. The desiccation of complement was successfully carried out by drying the fresh guinea-pig serum *in vacuo* over sulphuric acid; the product was quite soluble and little activity was lost. It is essential in the case of guinea-pig serum that the drying be rapidly carried out. Experiments were undertaken to investigate the stability of dried complement when stored at room temperature. During the first two months little change in activity was noted. Deterioration then set in and at the end of four months the value was reduced to half. During the following five months no further decline in value occurred. The authors suggest that such deterioration as does

occur is due to traces of moisture and that, if the moisture content be further reduced, the dried complement may be found to be even more stable. They hope that these dried reagents may prove of use to isolated workers in places where the obtaining and keeping of reagents for the Wassermann reaction are difficult and that the possibility of using these reagents in a relatively stable form may prove of service in the standardization of the Wassermann reaction.

#### The Wassermann Reaction in the Johns Hopkins Hospital.

J. E. MOORE (*The Bulletin of the Johns Hopkins Hospital*, January, 1923) analyses the results of the Wassermann reaction on the serum of forty-five patients. The tests were made with a uniform technique and by the same technical staff throughout. In the medical ward serum of every new patient is submitted to the Wassermann test and in a series of over seven thousand patients a reaction was obtained in the serum of 22.9% of coloured patients and in 12.6% of white patients. In a series of four thousand obstetric patients a reaction was obtained in the serum of 2.48% of all white patients and 16.29% of all coloured patients. In a series of over eight hundred gynaecological patients a reaction was obtained in the serum of 3.9% of white patients and of 19% of coloured patients. In the out-patient department the Wassermann test was not applied as a routine, but only when the history or physical findings suggested the presence of syphilis. It was noted that records from the departments of dermatology, surgery, ophthalmology and laryngology showed the highest percentages of syphilis. The author points out the importance of the use of the Wassermann test as a routine procedure. The serum of 14.2% of over four thousand patients in whom routine tests were made yielded positive reactions to the Wassermann test, whereas in over thirty-five thousand out-patients in whom the test was only applied when requested, the percentage of positive results dropped to 2.4%.

#### A Selective Culture Medium for the Diphtheria Bacillus.

E. A. GREENSPAN (*The Bulletin of the Johns Hopkins Hospital*, January, 1923) gives details of the preparation of a medium for the growth of the diphtheria bacillus which he claims is particularly adapted for the isolation of the bacillus when pure cultures are required for virulence tests. To seventy-five cubic centimetres of clear serum (human, pig or sheep) is added one cubic centimetre of a 50% sodium citrate solution and sufficient dextrose-veal-infusion broth or beef-extract broth to bring the volume to one hundred cubic centimetres. With a 3% citric acid solution the reaction is then adjusted to pH 6.4 by the colorimetric method with the use of di-brom-thymol in a dilution of one in ten for the preliminary colorimetric titration, but undiluted when added for adjustment of the reaction. The medium is then

placed in tubes, coagulated and sterilized by the fractional method on three successive days. It is claimed that the morphology of the diphtheria bacillus grown on this medium does not differ materially from that grown on Löffler's medium. The macroscopic appearance of the colonies presents definite yellowish coloration and greater luxuriance than is presented by colonies grown on Löffler's medium. The medium does not inhibit the growth of organisms closely allied to the diphtheria bacillus, such as *Bacillus xerosis* and Hoffmann's bacillus, but does inhibit the growth of the pneumococcus, *Streptococcus viridans*, *Streptococcus hemolyticus*, *Micrococcus catarrhalis* and *Staphylococcus albus*.

#### The Rôle of the Cockroach in the Dissemination of Disease.

J. W. S. MACFIE (*Annals of Tropical Medicine and Parasitology*, December, 1922) describes a series of experiments undertaken in the examination of cockroaches as possible carriers of pathogenic organisms. The cockroaches were kept singly in wide-mouthed glass jars and fed on bread smeared with the material it was desired the cockroach should consume. Each pellet of faeces passed subsequently was examined. The following were found to have passed unchanged through the alimentary tract of the cockroach and were therefore to be regarded as possible agents of infection, *Bacillus tuberculosis*, *Bacillus lepræ*, ova of *Anchylostoma duodenalis*, *Anchylostoma ceylanicum*, *Necator americanus*, *Ascaris lumbricoides*, *Trichuris trichiura*, *Tenia saginata* and *Schistosoma haematobium*. Similar results could not be obtained when the following were contained in the food: Gonococci, *Bacillus typhosus*, *Bacillus paratyphosus B* and *Bacillus dysenteriae* (Flexner Y). Doubtful results were obtained with the *Entamoeba histolytica* and *Entamoeba coli*.

#### Isolation of Bacteria in Pure Culture.

J. ORSKOV (*Journal of Bacteriology*, November, 1922) describes a simple method of single cell cultivation. The principle of this method is based on the fact that a bacterium can readily be distinguished on the surface of a clear, transparent medium, such as agar, gelatine or ascitic agar. A young bacterial culture, such as a twelve-hour old broth culture of a colon bacillus, is inoculated on an agar plate a few millimetres thick and incubated for an hour at 37° C. Small cubes of the agar are now excised with a sterile knife, placed on a sterile slide with the inoculated surface uppermost and examined under the microscope until an area containing one organism per field of vision is found. A magnification of seven hundred and fifty diameters and a uniform source of light reduced by means of an iris diaphragm are advised. The growth of the single bacterium can be watched at intervals and when the resulting colony has grown large enough to be visible with the low power of the mi-

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roscope, subcultures may be made in the following manner: A small piece of modelling wax is attached to the front lens of an objective and a short piece of platinum wire embedded in the wax and sterilized by flaming. By lowering the objective the colony is harpooned by the platinum wire and suitable media may then be inoculated.

#### HYGIENE.

##### The Relation of Canned Foods to Health.

WILLIAM G. SAVAGE (*The Lancet*, March 17, 1923) discusses the relation of canned foods to health. His remarks are based mainly upon four years' systematic laboratory investigation by himself and his colleagues. First of all he deals with the importation and control of canned foods and states that the conditions as regards labelling are most unsatisfactory in that many canned foods reached England unlabelled. He points out that this would make it impossible to trace a consignment should a food poisoning outbreak occur. A system of identification by stamping should be instituted. All canned preparations should bear the date of canning stamped on the lids. The method of destruction of unsatisfactory foods was far from good as in his opinion the best of it could easily be picked over and thus returned to circulation. The practice of piercing condemned tins was not universal. The prevailing view that, because the food is rendered sterile by the application of heat, it is maintained in a sterile condition by being kept in hermetically sealed containers does not represent the facts, *exempli gratia*, sweetened condensed milk is never free from bacteria. More important than absolute sterility is the type of bacteria present. Those found by the author included yeasts, obligate anaerobes, sporing aerobic bacilli, thermophilic bacteria and micrococci. The two important points in determining the ability of an organism to cause unsoundness are its proteolytic and fermentative properties. Organisms such as *Bacillus proteus* or the obligate anaerobes which usually possess both these properties, are the most potent causes of decomposition. Organisms which were fermentative but not proteolytic, such as the *Bacillus coli* group, caused tins to become "blown," but caused surprisingly little change in the contents. Organisms such as the micrococci which usually exhibited neither property, were comparatively harmless. The author points out that each group of organisms has to be considered in relation to the kind of food. His experiments showed that many sound tins contained bacilli, even of decomposing type, which remained dormant until lit up to activity by air access. Even with the anaerobes air access was a very important factor in spoilage, not because it allowed bacteria to get in, but because it permitted multiplication of bacteria already there. There is, however, a danger that incipiently decomposed food may be canned and

all living bacteria killed by sterilization. Such food may not decompose further and the tin would show no signs of unsoundness. The author found no evidence that the consumption of such tainted food was liable to set up disease or illness. The menace to health from canned foods could be bacterial, due to animal parasites, or it might be of a chemical or nutritional nature. The bacterial sources of infection were mainly specific food poisoning, botulism and there was also the possibility of food poisoning from the use of putrefactive food not specifically contaminated. Infected canned foods did not differ in appearance, odour or taste from sound foods, nor were there any changes in the containers. There are two groups. In one living bacteria were present; in the other the heating had killed the living bacilli and left the heat-resistant toxins. As regards botulism, available facts suggested that the spores of *Bacillus botulinus* might gain access to canned foods. The toxins and bacilli were easily killed by heat, but the spores were exceptionally resistant. Their ingestion probably does no harm, as they do not develop in the animal intestine. If they multiply in the tin they produce toxins and render the contents very poisonous; but fortunately the other products of growth are unpleasant and definite signs of spoilage present themselves. The author considers that tin poisoning from canned foods is a popular rather than a real danger. He states that canned foods have definite and special risks of their own, but these are not large and can be easily avoided.

##### Myopia in Industry.

N. BISHOP HARMAN (*The Journal of Industrial Hygiene*, January, 1923) discusses the consequences of myopia as an industrial disease of the eyes. An error in refraction, especially when combined with an error in muscle balance, may lead to a breakdown of a worker or cause a degree of crisis in which the worker becomes less efficient at his job. The author has investigated the records of 7,600 private patients in order to determine whether myopes engaged in close, continuous work are exposed to greater liability to breakdown or grave defect of vision than myopes not engaged in such work. Records were collected of four hundred and eighty patients who had a myopia of over three dioptres and who were between the ages of twenty and sixty. Patients with congenital myopia, that due to accident and monocular myopia, were not included. Of the four hundred and eighty patients one hundred and eighty-three were habitual close eye workers and two hundred and ninety-seven were engaged in other work. Of the habitual close eye workers, 53% suffered from failure of vision at some time of their career. Seventy suffered from breakdown of a more or less temporary nature and twenty-seven sustained permanent damage through the loss of an eye. Two persons lost the sight of both eyes. Among the other

workers failures occurred in 9.4% of the patients. Seven suffered from breakdown and twenty-one from permanent damage to the eyes. Four persons lost the sight of both eyes. The damage sustained by all these patients included such conditions as detachment of the retina, degeneration of the macular region, gross vitreous haemorrhages and rapid myopic cataract. Both the percentage of breakdowns and of damage to the eyes increased with the age of the patient and the degree of the myopia. The author concludes that the risks of myopia are heaviest with the patients whose occupations entail habitual close eye work. In view of the liability to damage young people with myopia of more than the lesser grades should be prevented from undertaking close work.

##### Child Hygiene and the Private Physician.

B. S. VEEDER (*The Journal of the American Medical Association*, December 30, 1922) enters a plea for the necessity of the recognition by practitioners of medicine of the problems connected with child hygiene. The methods employed in this connexion are those of specific means, such as a pure milk crusade, educational methods, such as propaganda and welfare clinics. Clinics often fail in their work for several reasons. Clinics are generally limited to children who are well. The children are not seen in their every-day surroundings. The personnel of the clinic changes too frequently and only a limited number of children are reached through its agency. The best results can be obtained by the direct and constant supervision of the family physician. The failure of many physicians in this regard is due to inadequate training. The care and feeding of the infant is equally as important as the study of the classification of disease and of pathological physiology. Prevention is as important as pathogenesis, diagnosis and treatment.

##### Climate and Tuberculosis.

H. SCHWATT (*New York Medical Journal and Medical Record*, January 3, 1923) thinks that there is no specific climate for the treatment of pulmonary tuberculosis. He considers that no one climate is suitable for all types of the disease and that it is the consensus of trustworthy opinion that tuberculosis can be successfully treated anywhere under a proper régime of rest, air, diet and time. There is no conclusive evidence to justify the belief that high altitude is of any specific influence in the disease. On the contrary, the great majority of the tuberculous and particularly those in the advanced stages, are harmfully influenced by altitudes of from three hundred to six hundred metres (one thousand to two thousand feet). Indigent consumptives, especially those in the advanced stages of the disease, should not be sent to high distant climates. The author states that it is important that these facts should become more commonly known among physicians and the laity.

## Special Article.

### HOSPITAL STANDARDIZATION.

It was in the year 1915 that the American College of Surgeons set itself the colossal task of reviewing, organizing and standardizing the work in the hospitals of the United States of America. It was recognized, as it must be by any student of the subject, that the functions of a hospital are various and its activities many sided. The primary object of a hospital is necessarily the treatment of those who are afflicted with disease or stand in need of medical attention for other reasons. In all attempts at reform or in any scheme that aims at the improvement of the status of medical training or teaching in connexion with hospitals, this fact must never be lost sight of. That a hospital is secondarily a training ground for nurses and students of medicine and for the use of graduates in post-graduate work is recognized not only by the medical profession, but by the majority of the members of hospital boards. The fact that a hospital is an indispensable factor in preventive medicine and medical research is not recognized by the members of hospital boards and is often lost sight of by medical practitioners. The latter, too, often think in terms of the laboratory and the laboratory only when discussing these important branches of medicine.

The American College of Surgeons took considerable trouble and spent much time in elaborating a scheme whereby the status of hospitals would be improved and their objects attained. A minimum standard was drawn up, a standard to which it was hoped the hospitals of the country would aspire. The next step was to survey the different hospitals and determine how many of them would fall in with the scheme and conform to the standard. This was in 1918. The hospitals of Canada were included in the proposal. The six hundred and seventy-eight hospitals in Canada and the United States of one hundred or more beds were first surveyed. Eighty-nine of these were found to reach the standard. The numbers grew as the years went on. In 1919 the requirements were fulfilled by one hundred and ninety-eight institutions. In 1920 the number was four hundred and seven. In 1921 the number of approved hospitals had risen to five hundred and seventy-nine, or 76%. In 1922 six hundred and seventy-seven, or 83%, of the eight hundred and twelve general hospitals with one hundred beds or over were on the approved list. In 1921 and 1922 the scheme was extended to include hospitals of fifty beds. In 1922, of the eight hundred and eleven general hospitals of between fifty and one hundred beds, three hundred and thirty-five, or 41%, had attained the minimum standard and been approved by the College. At the end of 1922, of 1,623 hospitals with fifty or more beds, 1,012, or 62%, had attained the standard. The progress has been rapid and, if any reliance can be placed in reports, the results satisfactory. The whole undertaking is past the experimental stage and may well be studied in a careful and critical manner in order to determine how far such provisions are applicable to Australian conditions.

#### The Minimum Standard.

The minimum standard as set out in the *Bulletin of the American College of Surgeons* is as follows:

1. That physicians and surgeons privileged to practice in the hospital be organized as a definite group or staff. Such organization has nothing to do with the question as to whether the hospital is "open" or "closed," nor need it affect the various existing types of staff organization. The word staff is here defined as the group of doctors who practice in the hospital, inclusive of all groups, such as the "regular staff," the "visiting staff" and the "associate staff."

2. That membership upon the staff be restricted to physicians and surgeons who are (a) competent in their respective fields and (b) worthy in character and in matters of professional ethics; that in the latter connexion the practice of the division of fees under any guise whatever be prohibited.

3. That the staff initiate and with the approval of the governing board of the hospital adopt rules, regulations and policies governing the professional work of the hos-

pital; that these rules, regulations and policies specifically provide:

- (i.) That staff meetings be held at least once each month. In large hospitals the members of the several departments may choose to meet separately.
- (ii.) That the members of the staff review and analyse at regular intervals the clinical experience of the medical officers in the various departments of the hospital, such as medicine, surgery and obstetrics, the clinical records of the patients to be the basis for such review and analysis.
- 4. That accurate and complete case records be written for all patients and filed in an accessible manner in the hospital, a complete case record being one, except in emergency, which includes the personal history, the physical examination with clinical, pathological and X-ray findings when indicated, the working diagnosis, the treatment (medical and surgical), the medical progress, the condition on discharge with final diagnosis and in the case of death the autopsy findings when available.

- 5. That clinical laboratory facilities be available for the study, diagnosis and treatment of patients, these facilities to include at least chemical, bacteriological, serological, histological, radiographic and fluoroscopic service in charge of trained technicians.

It will be seen from this detailed statement of the required standard that, although the hospital authorities are required to provide adequate facilities for laboratory methods of investigation, diagnosis and treatment, the major portion of the requirements has to be met by the members of the medical staff.

#### Composition of the Staff.

All practitioners attending a given hospital are included in the term staff as applied to that institution. The regular staff is represented in Australian hospitals by the paid resident staff, that is, the medical superintendent, registrars, house physicians, house surgeons and so forth. The visiting staff is the honorary staff and the associate staff consists in the clinical assistants and those practitioners who attend in a similar capacity. The consultants of the Australian hospitals would probably be included in the associate staff. A staff in the majority of the hospitals under this scheme has certain office-bearers—a president, a vice-president, a secretary and a small committee. The secretary acts as the channel of communication between the board of management and the staff and the committee probably will consist of three members, one representing the physicians, one the surgeons and one the specialists in other branches.

#### Dichotomy.

The American College of Surgeons, in restricting membership of a staff to those who are competent in their respective fields and worthy both in character and ethics generally, take such a serious view of dichotomy or fee splitting that its practice is specially prohibited. Dichotomy is one of the offences against the ethics of medical practice that is singled out by the General Medical Council of Great Britain. It is unfortunately common, much more common than is supposed, especially in its milder and more insidious forms. The *modus operandi* is generally that the surgeon operates and collects the fee. Later on he hands on to the practitioner who referred the patient to him, a certain percentage of the fee. It may be done in the other way. The practitioner collects the fee for the surgeon and in accordance with a private arrangement retains part of the fee. It has been done in other ways. The surgeon sends to the referring practitioner a present of books or some other articles that will be of use. The whole procedure is corrupt. The general practitioner or physician as the case may be, is not a commission agent nor is the patient a salable article. That the surgeon is often paid more than he should be in proportion to the fees received by the physician and the pathologist is obvious. This can be remedied, but it must be done not by private arrangement between the various practitioners in attendance, but by each one making his own individual charge and by the practitioner in charge of the patient be he surgeon or otherwise, insisting on the proper recognition by the patient of the part played by each investigator.

In the report for 1921 published by the American College of Surgeons on hospital standardization this question

is discussed very fully. It is pointed out that the evils of dichotomy are threefold. In the first place, it makes for incompetent surgery. The surgeon who adopts fee-splitting, gets his practice as a rule not on account of his merit, but on the percentage that he will hand over to those who send patients to him. The more incompetent he is, the larger is the percentage that he is prepared to give away. Secondly, fee-splitting makes for unnecessary surgery. Surgery in this way becomes a commercial enterprise and ceases to be a professional service. In the third place, by introducing dishonesty the whole medical profession is lowered in the eyes of the public.

#### Staff Meetings.

The tower of strength of the whole standardization scheme is the staff meeting. The success or failure of the whole undertaking will probably depend on the way in which this part of the programme is carried out. Meetings are held once a month. Attendance at these meetings is obligatory as a rule on the regular staff. In some hospitals the members of the visiting staff are only required to attend when their patients are under review. In other hospitals attendance is required of the whole staff. In all institutions failure to attend a certain number of meetings requires a satisfactory explanation. Failure to do this may lead to compulsory retirement from the staff of the institution. At these meetings an analysis of the work of the hospital for the previous month is presented. A form is recommended by the College of Surgeons for use in this regard. On this form are spaces in which the number of patients discharged is to be filled in. An analysis is made of the condition of the patients at the time of discharge. In regard to diagnosis the numbers are given of instances in which the provisional and final diagnoses agree and in which they do not agree. The number of patients discharged with an additional diagnosis and those with no diagnosis must also be stated. It is generally required that a complete history of the patient's condition must be taken within a period of thirty-six hours of admission. On this form the provisional diagnosis must be stated. In the analysis of the work of each member of the staff the agreement or otherwise of the provisional and final diagnoses are noted. Repeated difference between these renders an explanation necessary from the member of the staff concerned.

#### Case Records.

The case record of a patient's condition includes his whole history, the condition found on examination, the provisional diagnosis, the treatment, pathological reports, X-ray reports, final diagnosis and end result. It is claimed by the American College of Surgeons that the example set by the United States Army Medical Department has been the inspiring influence in this regard. It is pointed out that the report of the Surgeon-General of the Army was a most complete document and that it was compiled entirely from the case records of individual soldiers. The question is asked as to why the same reports should not be available in all hospitals. The case record is a test of medical honesty, but it also acts as a check on the character of the service by minimizing the errors of clinical practice. It serves as a direct test of efficiency. The question of full case records in the case of private patients has been discussed. It has been claimed that many patients will object to having a full account of their history taken and that the taking and filing of these records would be a breach of professional confidence. It is pointed out that the case records should be under the control of one permanent officer and that access to them should only be obtainable at the direct request of the patient himself or of the practitioner in charge. The protection of the records is a responsibility which the hospital owes to the patient and the doctor.

#### Effect of Standardization.

The effect on the utility of the institution as a whole will be most evident when the public has been taught what the scheme of standardization means. Patients will seek treatment in institutions where they know standard work is carried out. From the patient's point of view standardization is desirable. He will have some check on the quality of the work that is done for him. He will get more team work. It is probably true that the patient

in a large metropolitan hospital in Australia at the present time gets the most complete team work. The team work which he gets, however, is left entirely in the hands of the practitioner attending him. Under a scheme of standardization his medical attendant would have to give an account to the staff as to why he had not had complete laboratory investigations carried out in regard to a patient or he might have to give an answer to the inquiry as to why no skiagraphic examination had been made. The fact that the patient's records were kept would bring him back to the institution in case of any future illness.

From the point of view of the quality of the work done under the minimum standard it must be obviously advantageous from every aspect. The meetings of the staff could not fail to be helpful, provided members of the staff were honest and bent on giving constructive and not destructive criticism. It may be urged that in the various hospital clinical societies in existence in Australia this sort of thing is done. This is hardly the case. At a clinical society a practitioner chooses to demonstrate a patient in dealing with whom he has been particularly successful and in regard to whom he can claim a certain amount of *kudos*. Under the hospital standardization scheme the inquiry and review will embrace not only the successful, but the unsuccessful work. That such inquiry would lead to greater keenness and more care in preparing histories and to greater accuracy in diagnosis is certain. The result of the keeping of good and complete case records is important. If these records are kept under the care of one individual who is not a layman and who can devote the time to analysis of results, there would be the possibility of securing contributions to medical knowledge that it is impossible to obtain at the present time. If nothing else were possible, it might be the means of the production of an annual hospital report that would be more than a compilation of figures by a layman who uses them as the sugar to coat the pill containing an appeal for funds. The two functions of a hospital report can be combined, as has been pointed out in the pages of this journal on more than one occasion.

Critics may say that the whole scheme is idealistic. This may be so, but no reforms have been obtained without the constant thought of an ideal to be achieved. The scheme has been successful in America. The hospital management in Australia may not be similar to that in America in regard to the private hospitals, but a start can easily be made with the general hospitals. If the honorary medical officers can persuade the boards of control that they will obtain something useful and the subscribers that they will secure better service, the inception of an Australian minimum standard would soon occur. Progress must necessarily be slow, but in time public opinion would make it impossible to continue under the present conditions. The present-day private hospital in many instances has been fashioned by the conversion of a cast-off mansion and is in no way to be compared with the modern instrument of service that the sick man has a right to demand.

### Naval and Military.

#### THE MEDICAL HISTORY OF THE WAR.

We are in receipt of a communication from Dr. A. Graham Butler, D.S.O., who has undertaken the task of writing the medical history of the war. Dr. Butler is anxious to supplement the data already in his possession by means of records of personal experiences, observations and impressions, favourable or otherwise, from medical practitioners who served in Gallipoli, France and Palestine. Information as to experiences and first-hand knowledge of work on transports and hospital ships from Gallipoli is desired and it is also hoped to obtain records of the conditions existing at Alexandria in 1915 from the medical point of view, especially in regard to the reception of the wounded from transports and their disposal. Dr. Butler also asks for some account of the August fighting on Gallipoli. In regard to the work in France, any records of personal experiences in the treatment and evacuation of wounded through the various hospital units will be welcomed. Photographs of medical interest will be most acceptable. It is to be hoped that Dr. Butler's appeal will meet with a generous response.

## British Medical Association News.

### SCIENTIFIC.

A MEETING OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on March 2, 1923, at the B.M.A. Building, Adelaide Street, Brisbane, Dr. D. A. CAMERON, the President, in the chair.

#### Fracture of the Tibia.

DR. E. D. AHERN exhibited a skiagram of a fracture of the posterior tibial spine without injury to the ligaments of the knee joint.

#### Recurrent Subluxation of the Hip.

DR. A. V. MEEHAN read notes on "Recurrent Subluxation of the Hip of Traumatic Origin" and presented the patient (see page 529).

DR. G. P. DIXON, C.B.E., doubted the correctness of the diagnosis. He considered that the condition was that of snapping hip associated with a loose joint capsule.

DR. E. D. AHERN thought that it was purely snapping of the hip.

In his reply, DR. MEEHAN said that the discussion seemed to hinge on a confusion of terms. It had been suggested that the condition was snapping hip, although it was admitted that laxness of the capsule was the cause of the condition in the patient. "Snapping hip" was a term applied to a condition in which the tendon of the *gluteus maximus* slipped over the great trochanter and gave rise to an audible snap. The capsule of the hip joint was not involved and the condition was readily cured by a plastic operation on the tendon. The condition from which his patient was suffering, obviously did not correspond to that description. It was a true subluxation of the joint.

#### Tuberculous Diseases of the Shoulder.

DR. E. D. AHERN read a paper entitled "Surgical Treatment of Tuberculous Disease of the Shoulder Joint" (see page 515).

DR. A. V. MEEHAN congratulated Dr. Ahern on his excellent results. Tuberculosis of the shoulder joint was very rare. Joint tuberculosis was eminently curable. Ollier's incision was the best method of approach, unless the focus lay in the posterior part of the joint. The head of the humerus should always be dislocated in order to enable the surgeon to obtain a complete inspection of the posterior surface of the head and the bursa behind the *sub-scapularis* and *infra-spinatus* muscles.

#### Acute Osteo-Myelitis.

DR. NEVILLE G. SUTTON read a paper entitled "Problems of Acute Osteo-Myelitis" (see page 517).

DR. J. J. POWER, D.S.O., referred to the need for early operation. He mentioned a case in which he had kept the patient under observation for a considerable time. After the operation had been performed, multiple metastatic abscesses had developed.

DR. A. V. MEEHAN said that early diagnosis followed by free drainage and removal of the bone with the chisel down to the medulla resulted in the elimination of the process in nearly all chronic osteo-myelitic infections. He thought that it was strange that drainage had not been recognized as the important measure of treatment, since this method was adopted in other conditions. He suggested that the reason might be traced to the fact that osteo-myelitis was a general infection. Perhaps want of success in the past might have had something to do with this.

DR. E. D. AHERN thought that the less that was done in any bone condition the better it was for the patient. The bone should be removed as far as healthy medulla. The more chronic the condition, the larger was the amount that should be removed.

DR. G. P. DIXON advocated free incision and drainage, but he disapproved of curetting. This was not carried out

in any other acute suppurative condition. In young children the surgeon should cut down to the bone, bore a hole and institute drainage. If pus were found, the opening should be enlarged. In osteo-myelitis of the upper end of the femur it was often difficult to know where to make the incision. The surgeon usually waited for definite signs to appear and in consequence the results were not good.

DR. D. A. CAMERON expressed the view that the bones of young children during acute illness should always be examined. This was not infrequently overlooked, although a careful examination of the chest and abdomen was carried out. In very acute osteo-myelitis all that could be done was to cut down and drill the bone. Anything more usually caused a fatal result.

### NOMINATIONS AND ELECTIONS.

The undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

- BARTON, NATHANIEL DUNBAR, M.B., Ch.M., 1923 (Univ. Sydney), Nanima, Wellington.
- COOKE, BAKER RANDELL, M.B., Mast. Surg., 1922 (Univ. Sydney), c/o G. W. O'Neal, Esq., "Chamber of Commerce Building," Grosvenor Street, Sydney.
- KEIRAN, JOHN BERNARD, M.B., B.S., 1922 (Univ. Melbourne), 362, New South Head Road, Rose Bay.
- KLEIN, KEITH, M.B., Mast. Surg., 1923 (Univ. Sydney), Lithgow Street, Campbelltown.
- LEVY, JACK, M.B., Ch.M., 1923 (Univ. Sydney), 249, King Street, Newtown.
- LUDOWICI, RALPH HAROLD, M.B., Ch.M., 1922 (Univ. Sydney), Newcastle Hospital, Newcastle.
- MILES, ERIC HILTON, M.B., Ch.M., 1923 (Univ. Sydney), Ware Street, Fairfield.
- SUSMAN, MAURICE PHILIP, M.B., Mast. Surg., 1921 (Univ. Sydney), 8, Kinnell Court, Elizabeth Bay.

### NOTICES.

THE COUNCIL OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION has arranged the following provisional programme of the Branch meetings. The Scientific Committee reserves to itself the right to modify the arrangement, but it is hoped that no changes will be necessary.

June 6, 1923.

CLINICAL MEETING at the Melbourne Hospital.

July 4, 1923.

*At the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne Hospital,*

at 8.15 p.m..

MR. W. KENT HUGHES: "Small Defects that Cause Serious Foot Disability and Their Treatment: Corns, Bunions, *Hallux Valgus*, Hammer-Toe, Weak Ankles, Flat Foot, including Metatarsalgia."

August 1, 1923.

CLINICAL MEETING at the Alfred Hospital.

### MISSING JOURNALS.

THE following journals, which have been received by THE MEDICAL JOURNAL OF AUSTRALIA as exchanges, are missing. Each copy bears the stamp impression of this journal. It is requested that the present possessors of these missing journals return them to this office.

*The American Journal of Anatomy: May, 1920.*

*Bulletin of the Johns Hopkins Hospital: April, September, 1916; February, April, July, 1918; September, 1920.*

*The Journal of Orthopaedic Surgery: February, 1921.*

*New York Medical Journal: February 28, May 29, December 11, 1920; Index, January to June, 1921.*

## Public Health.

### TASMANIA.

THE DIRECTOR OF PUBLIC HEALTH OF TASMANIA, DR. E. SYDNEY MORRIS, has presented the Annual Report of the Department of Public Health of Tasmania for the year ended June 30, 1922. A departure has been made from the usual practice in issuing the report. In previous years the report covered a period of twelve months to coincide with the termination of the financial year on June 30. In all other States of the Commonwealth the calendar year is adopted as a basis. The present report deals with financial matters for the year ending June 30, 1922, whilst almost all other data are for the preceding calendar year ended December 31, 1921.

In the introduction to his report the Director reiterates statements which have frequently been made in the columns of this journal. He discusses infectious diseases which are readily preventible, from the point of view of financial loss in treatment. He estimates that a sum of fifty thousand pounds sterling was spent in 1921 in the treatment of diphtheria, scarlet fever and typhoid fever. He states that if other economic factors involved in the occurrence of these diseases are taken into account, the financial loss to the community is in the neighbourhood of £100,000. Indifference is the general characteristic of the public attitude to health matters. The reason for this is that there is involved an expenditure of money with no immediate evident gain. He states once more that "prevention is better than cure." He pleads for reorganization with a view to obviating the defects of the Department and concludes that so long as the bliss of ignorance is preferred to the wisdom of health, so long will the present conditions be tolerated.

#### Notifiable Infective Diseases.

The conditions described in this portion of the report cannot be regarded as satisfactory. It would appear that the Department in some instances issued instructions in regard to what steps should be taken in dealing with certain conditions. These instructions seem to have been accompanied by little more than a pious hope that they would be carried out. Thus it is stated in regard to the Schick test that each medical officer of health was requested to induce his local authority to allow certain work to be carried out. There should be some means of seeing that pious hopes have some chance of realization.

#### Bubonic Plague.

In regard to bubonic plague, the main efforts of the Department were directed at preventing the introduction of the disease into the island from the infected ports of Brisbane and Sydney. As a result of the work in this direction, local supervision of other matters took a secondary place. Smallness of staff was responsible. The fumigation of ships was carried out with regularity and a campaign against rodents was instituted. It is stated in the report that many thousands of rodents were accounted for. According to the appended report of the Government Bacteriologist, nine hundred and forty-five rodents were submitted to examination. None of these was affected.

#### Diphtheria.

The number of notifications of diphtheria infections (2,055) was the highest ever recorded in the history of the State. The incidence was 96.3 per 10,000 of population. In this regard Tasmania headed the list of States of the Commonwealth. The numbers for South Australia, Victoria, New South Wales, Western Australia and Queensland were respectively 55.3, 50.7, 32.9, 32.6, 31.8 per 10,000. The Director expresses the opinion that the number of cases reported is in excess of the actual number of true infections by diphtheria. He states that any serious throat trouble is regarded as being due to diphtheria. In this he is not very complimentary to the diagnostic powers of the practitioners of Tasmania. Between 3% and 4% of the children examined in schools were found to harbour the diphtheria bacillus in their throats. The Department during the year issued a book of instructions in regard

to the Schick test and antitoxin immunization. Apparently the advice was unheeded, for "expense barred the way." Mention is made of one school in which one hundred and fifty children were immunized. Unfortunately no particulars concerning the outbreak of the disease in the vicinity of this school are given. The death rate for diphtheria was 2.9 per 10,000 of population. The case mortality was 3%.

#### Scarlet Fever.

Scarlet fever existed in epidemic form. The number of notifications was five hundred and ninety-eight. Six patients died. The disease did not spread as rapidly as diphtheria. In the opinion of the Director this was not due to any effort at control, but to inherent peculiarities of the disease.

#### Typhoid Fever.

The Director finds discouragement in the fact that three hundred and five patients were attacked by typhoid fever. He regards this as a sign of defective sanitation. Twenty-six of the patients died. Several municipalities in which active sanitary measures were undertaken, were comparatively free from the disease.

#### Pulmonary Tuberculosis.

Two hundred and forty patients were notified during the year as suffering from pulmonary tuberculosis. This represents an incidence rate of 112.48 per 100,000 and is the highest for five years. The death rate exceeded the average death rate from this disease in the whole Commonwealth. At the present time there is no control over the patients and it is impossible for the Department to keep in touch with them. The Director suggests that if the present expenditure on invalid pensions necessitated by this disease were supplemented in order to inaugurate an effective system of control, the ultimate future expenditure would be curtailed.

#### Puerperal Septicæmia.

Twenty-two patients were reported as suffering from puerperal septicæmia during the year. On the notification being made, it is customary to suspend the midwife from duty for one month and to request the medical attendant to refrain from attending other midwifery patients for a like period.

#### Goitre.

Goitre is endemic to Tasmania. In order to obtain some idea of its prevalence it was made voluntarily notifiable for a period of twelve months. The number of notifications was six hundred and forty-four. The Director points out that this cannot be taken as a definite figure for the incidence because certain medical practitioners did not bother to report any instances at all. He thinks, however, that the figures of the distribution give a rough idea of the distribution of the disease throughout the State. The majority of the patients lived in the southern portion of the island. Of the six hundred and forty-four patients the large number of two hundred and thirty-nine lived in the neighbourhood of New Norfolk, that is, the country along the course of the Derwent River. No geological or climatic reasons could be found to explain the distribution. Sixty-nine of the patients were males and five hundred and seventy-five were females. Five hundred and thirty-three of the goitres were of the parenchymatous type, sixty-six were adenomatous and forty-five exophthalmic. Examination of the age distribution showed that the disease was most prevalent in the period between youth and middle age. The medical inspector of schools of the southern portion of the State examined 2,581 children and found that one hundred and forty-nine of them were suffering from simple or parenchymatous goitre. Among these school children there were no instances of exophthalmic goitre. The evidence gathered in regard to the water supply of the affected areas failed to throw any light on the causation.

#### Child Welfare and Infantile Mortality.

Child welfare nurses are stationed at Hobart, Moonah and Launceston. The Director claims that progress is being made in the direction of welfare work, but states that it is rather disconcerting to discover that in those

places where welfare work is carried on, the infant mortality is highest. Most people would be inclined to agree with him. A possible explanation may lie in the fact that these areas are the most populous in the State and therefore more liable to be the site of fatal gastro-enteritis. This disease assumed a virulent form in 1921. Tasmania has the proud distinction of having the highest infantile mortality rate of all the States in the Commonwealth. There were four hundred and fifty-one deaths of infants under the age of one year, equivalent to an infantile mortality rate of 78.4 per thousand births. This cannot be regarded as a satisfactory state of affairs. The Director states that greater efforts and a wider outlook are essential for the control of these things. Again most people will agree with him. He pleads for a larger staff and more efficient organization. The Director is not able to supply a larger staff and without it efficiency of organization, though in his own hands, is ineffective.

#### Venereal Diseases.

For the year 1921 four hundred and seventy-three patients were reported as suffering from venereal disease. Of these two hundred and forty males and seventy-six females suffered from gonorrhoea, seventy-six males and forty-five females from syphilis and thirty-six males from chancroid. The great majority of these persons were treated at the public hospitals. A small number were treated as private patients and any persons who could not afford to pay private fees and who lived at a distance from a public hospital, were treated by private practitioners at the expense of the Department. Though he does not wish to be dogmatic, the Director is not satisfied that the methods of control as laid down by legislation are achieving their object. He advocates more careful instruction to adolescents in regard to sexual matters.

#### Midwives.

Tasmania is fortunate in that it possesses an Act regulating the practice of midwives. At June 30, 1922, the number of midwives in the State was three hundred and nineteen. The law does not prohibit a woman from rendering assistance in an emergency and it is not regarded as an offence for a woman who is not a certificated midwife to act under the control of a medical practitioner. Three prosecutions were instituted for breaches of the law and a conviction was obtained in each instance.

#### Bacteriological Laboratory.

The work of the bacteriological laboratory is apparently confined mainly to the routine examinations connected with diagnosis. The bacteriologist is a layman. The Director reiterates his statement of previous years that a medical man should be appointed to this position. The work is waiting to be done. Some 25,146 examinations were made during the year. At the present time Wassermann tests are not undertaken in the State and all sera have to be sent to Melbourne for this purpose. This ought not to be. It is ridiculous to expect that the Director with his onerous duties could undertake any of this work. As he states, the whole realm of pathology is largely untouched at the present time. The Government "is spoiling the ship for a halfpenny worth of tar." The general public is not receiving just treatment in this regard. Unfortunately they do not realize it. The trouble is that the provision of an efficient health service is not a vote-catching expedient.

#### ANTHRAX.

THE following regulations, published in the *New South Wales Government Gazette*, No. 47, of April 20, 1923, are of interest to medical practitioners throughout the Commonwealth. The regulations have been made by the Governor-in-Council on the advice of the Board of Health under the provisions of the *Public Health (Amendment) Act, 1921*.

"7A. It shall be unlawful to use in any manufacturing process the hair, wool or hide of any animal infected with anthrax.

"7B. (1) Any officer may seize and remove for bacteriological examination in a laboratory controlled by the Department of Public Health or approved by the Director-General of Public Health, any shaving brush or other article which he has reasonable grounds for believing is infected with anthrax.

"(2) No person shall sell or offer for sale or retain upon his premises for sale any shaving brush which is not indelibly and conspicuously branded with the name and address of either the wholesale or retail vendor or that of the manufacturer if resident in New South Wales. The registered New South Wales trade-mark of any of the above persons may be used in lieu of name and address.

"(3) No barber shall use a new shaving brush for the first time without previously disinfecting it by soaking it for half an hour in 10% solution of formalin in warm water and afterwards rinsing in clean water."

#### Obituary.

JOHN HARRIS.

THE death of Dr. John Harris, which we recorded in our issue of May 5, 1923, has removed from the ranks of the medical profession one of its prominent members and from the city of Newcastle one of its most popular and best beloved citizens.

John Harris was born seventy-four years ago in County Wexford, Ireland. At the age of two years he was brought by his father, Matthew Harris, to Australia. Matthew Harris was a scholarly man and a graduate of Trinity College, Dublin. He was one of those intrepid settlers who helped to fashion the history of Australia. With his small son John he settled at O'Connell, near Bathurst, New South Wales. Schools were few and far between in the country in those days and the growing lad lived an out-door life with a scholarly father who laid the foundations of a good education. He instructed his boy in Latin, Greek and history. His uncle, Richard Harris, about whom two interesting articles have recently been published in THE MEDICAL JOURNAL OF AUSTRALIA from the pen of Dr. N. J. Dunlop, was at this time in practice at Newcastle.

Richard Harris prevailed on his brother to send John to him. John Harris thus arrived in Newcastle at the age of sixteen years. He went for a while to Mr. Theodore's school, but left it after a few months to become temporary dispenser to his uncle. Here the boy displayed such natural ability and fondness for the work that his uncle retained him permanently in the position. In this way it came about that John Harris eventually went to Aberdeen University to study medicine. His enthusiasm was undiminished and in 1874 he graduated as bachelor of medicine and master of surgery of that university. At the same time he was admitted as licentiate of the Royal College of Physicians and of the Royal College of Surgeons of Edinburgh. It is interesting to note that thirty years later two of John Harris's sons studied medicine at their father's alma mater and found preserved in the museum some dissections that had been done by their father thirty years before. In 1883 John Harris obtained the degree of doctor of medicine of Aberdeen University.

After graduation in 1875 John Harris returned to Newcastle and began to build up his large and extraordinarily successful practice. Possessed of robust health and boundless energy, he did not spare himself. The amount of work which he was able to accomplish was phenomenal. As a colliery surgeon he first won the hearts of the people of Newcastle, with his transparent honesty, his energy and his fixity of purpose it could not be otherwise. Those who knew him intimately tell of his many acts of kindness and benevolence, how he not only gave advice and treatment to the necessitous, but often provided them with the necessities of life. In spite of the volume of work connected with a large practice, John Harris was not slow to recognize and take advantage of the progress of medicine as a science. Surgery attracted him and he became an expert and reliable surgeon. The Newcastle Hospital owes much to him in this connexion. First of all as paid visiting surgeon and later as honorary surgeon he was

of those who helped to build up the institution and secure for it the reputation of excellence of service that enjoys to-day. Among the other appointments held by me were those of surgeon to the Permanent Artillery forces and Government Medical Officer.

As a citizen John Harris recognized his responsibilities and acted accordingly. He was for a period a member of the Newcastle City Council and when a squadron of the militia was formed in Newcastle in the 'nineties he joined up and held the rank of captain.

In his private capacity John Harris won the affection of a wide circle of friends. His home was his delight and here those who were privileged to enter, were able to enjoy best his delightful and cheery companionship. A lover of music and of literature, he was able to find a delight in mental recreation among his favourite authors. Of the poets, Byron and Burns appealed to him most and he could recite long passages of their works from memory. More than this, it was hard to find his equal as a *raconteur* and his fund of anecdote was enormous. The fates were unkind to him and he was stricken with a long and painful illness which he bore with a courage and fortitude that were typical of him.

John Harris is survived by his wife, five sons and four daughters. All his sons and one daughter belong to the medical profession. To them the sympathy of many is extended.

DR. N. J. DUNLOP, Newcastle, writes:

Towards the end of last century I went to Stockton to act as *locum tenens* for the late J. W. Hertel; I was then a young and comparatively inexperienced man. Shortly after I had taken over the practice, I was called on to deal with a very bad case of enteric fever. Being new to the district, I wished to have some well-known practitioner to share the responsibility and so Dr. Harris came in as consultant. He was the first doctor I met in the Newcastle district and I was the last outside his immediate family circle whom he recognized before he passed away. From our first meeting a friendship which deepened into great affection began between us and was only severed by his death. I came into frequent touch with him when I was appointed medical superintendent of the Newcastle Hospital and later on as one of his colleagues on the honorary staff. He was a man of great learning, medical and general, and in addition was cultured, kindly and generous, always ready to spend and be spent for the help and encouragement of his brothers of the craft. How great a help to me he was in my early years here it would be difficult to compute, but I have to thank him for much kindly advice and encouragement which I can never forget. He had the happy way common to most big, generous natures of making younger men feel they were giving instead of receiving help. When I was asked to take charge of his case in his last illness I felt I had been greatly honoured and with my friend, Dr. Nickson, who shared the responsibility with me, saw how a brave man can die. His trouble would have but one ending and he must have known this from the beginning, but he was always cheerful in his breezy, optimistic fashion and his well-known hand-grip was strong and reassuring till he was far spent. He was, in spite of his agony and discomfort, an inspiration and tonic to those about him. Personally I consider it was a privilege to have known and had the friendship of John Harris; we are all the poorer for his empty place and the world is the better for his having lived. When that can be truly said of a man he has not lived in vain.

DR. R. H. TRELOAR, Double Bay, writes:

Dr. John Harris was a man of sterling qualities, of large sympathies and a much esteemed citizen. No doctor in the northern district was better known or had a wider reputation. For years and until his death he was the police surgeon at Newcastle. As a medical witness in the law courts he had few equals; his logical mind and knowledge of medical jurisprudence made him a witness difficult to badger. Old and wily barristers declined the invitation; occasionally, however, a fledgling, with the

assurance of youth, made the attempt. Then the Bar sat up and smiled.

By day or by night Harris was willing to give help to a colleague and to a man in a wet singlet struggling with an occipito-posterior the sound of that cough which heralded the arrival of "Old John" was sweeter music than a symphony. He was a popular consultant and, though strictly loyal to a fellow practitioner, he was most careful to safeguard the interest of the patient. In the presence of the latter he was deferential to the callow attendant, but away from the hearing of an eavesdropper he would say in his quiet, tactful way: "Don't you think we might make just a little change in the medicine?"

Of his undoubted attainments others may write, but of Harris as a true and faithful friend our uninterrupted friendship of forty-five years enables me to speak feelingly. Unfortunately lack of space precludes the recital of many quaint episodes in the life of my dear old friend. His death will leave a gap in Newcastle, whilst down deep in the souls of hundreds the memory of this grand old man will be long and lovingly cherished. He was one of a type of doctor that is disappearing and leaving the world poorer. May God rest the soul of John Harris!

## Proceedings of the Australian Medical Boards.

### NEW SOUTH WALES.

The undermentioned have been registered under the provisions of the *Medical Act, 1912 and 1915*, as duly qualified medical practitioners:

- ALLARD, EDITH VICTORIA, M.B., 1923 (Univ. Sydney), "Bundarra," Woonona Avenue, Wahroonga.
- ANDERSON-STUART, BOUVERIE PRIMROSE, M.B., 1923 (Univ. Sydney), "Lincluden," Fairfax Road, Double Bay.
- ANDREW, MARSHALL, M.B., 1923 (Univ. Sydney), "Boorock," Grosvenor Road, Wahroonga.
- ASHBY, HARRY LAWTON, M.B., 1923 (Univ. Sydney), Dean Street, Albury.
- BACK, ROBERT FERGUS, M.B., 1923 (Univ. Sydney), "Trenayr," West Street, Petersham.
- BARTON, NATHANIEL DUNBAR, M.B., 1923 (Univ. Sydney), Nanimo, Wellington.
- BATES, DORIS CRYSTAL, M.B., 1923 (Univ. Sydney), "Chepstowe," Albert Road, Strathfield.
- BRADDON, PAUL DUDLEY, M.B., 1923 (Univ. Sydney), "Elvo," Edgecliff Road, Woollahra.
- BROWN, ULRIC LYLE, M.B., 1923 (Univ. Sydney), "Fosterton House," Dungog.
- BURNETT, ROLAND KENT, M.B., 1923 (Univ. Sydney), Post Office, Watson's Bay.
- BYE, WILLIAM ALICK, M.B., 1923 (Univ. Sydney), Post Office, Miranda, via Sutherland.
- BYRNE, VINCENT CHARLES, M.B., 1923 (Univ. Sydney), Cameron Street, Kogarah.
- CAMPBELL, REID INNES, M.B., 1923 (Univ. Sydney), "Post Office House," Woollahra.
- CARROLL, HERBERT BUCKWORTH, M.B., 1923 (Univ. Sydney), "Neston," Livingston Road, Marrickville.
- CARRUTHERS, DOUGLAS GORDON, M.B., 1923 (Univ. Sydney), "Highbury," Old South Head Road, Waverley.
- CHAMPION, CHARLES GEOFFREY, M.B., 1923 (Univ. Sydney), 25, Gladstone Street, Kogarah.
- CHESTERMAN, JOHN NICHOLSON, M.B., 1923 (Univ. Sydney), "Lurnea," Vaucluse Road, Vaucluse.
- COLES, JOSEPH HARRY, M.B., 1923 (Univ. Sydney), "Lanior," 65, Edgeclif Road, Woollahra.
- COLWELL, ALAN RUDFORD, M.B., 1923 (Univ. Sydney), "The Parsonage," Darling Street, Rozelle.
- COOPER, ARTHUR GEORGE STENING, M.B., 1923 (Univ. Sydney), "Norella," Beechcroft Road, Cheltenham.
- CRAMSIE, JACK HALLING, M.B., 1923 (Univ. Sydney), "Niagara," Reid Street, Cremorne.
- CUTHBERT, NOËL MILLAR, M.B., 1923 (Univ. Sydney), Nelson Road, Lindfield.
- DAVEY, RICHARD DUNCAN, M.B., 1923 (Univ. Sydney), 17, Bennett Street, Bondi.

- DAWES, SYDNEY ROBINSON, M.B., 1923 (Univ. Sydney), 2, Paul Street, Balmain.  
 DODS, LORIMER FENTON, M.B., 1923 (Univ. Sydney), "Fenton," Albert Street, Edgecliff.  
 D'OMBRAIN, ARTHUR WOLSELEY, M.B., 1923 (Univ. Sydney), Dudley Street, Roseville.  
 DOWNES, CLEMENT JAMES, M.B., 1923 (Univ. Sydney), Dickson Street, Haberfield.  
 DUKE, CHARLES LESLIE SWINNERTON, M.B., 1923 (Univ. Sydney), 426, Darling Street, Balmain.  
 DUN, CHARLES WILLIAM SUTHERLAND, M.B., 1923 (Univ. Sydney), 6, "Koombah Flats," Bay Road, North Sydney.  
 DURIE, ETHEL BEATRIX, M.B., 1923 (Univ. Sydney), Railway Street, Chatswood.  
 ELLIOT-SMITH, MERVYN HARRIE, M.B., 1923 (Univ. Sydney), "Koorin," 39, Shellcove Road, Neutral Bay.  
 ELLIOTT, MERVYN EVERARD HAY, M.B., 1923 (Univ. Sydney), "Eurunderee," First Avenue, Wentworthville.  
 ELPHICK, VIVIAN ROY, M.B., 1923 (Univ. Sydney), "Carlyle," Wyndham.  
 EVANS, ARNOLD STRATHFULL, M.B., 1923 (Univ. Sydney), "Mandino," Abbotsford Road, Homebush.  
 FINLAY, CUTHBERT CLIVE, M.B., 1923 (Univ. Sydney), "St. Berner," Kemmis Street, Randwick.  
 FLETCHER, ROBERT HORNER, M.B., 1923 (Univ. Sydney), c/o. Pigott & Stinson, Solicitors, 2, Castlereagh Street, Sydney.

### Books Received.

- A TEXT-BOOK OF THE SURGICAL DYSPEPSIAS, by A. J. Walton, M.S., M.B., B.Sc. (Lond.), F.R.C.S. (Eng.); 1923. London: Edward Arnold & Company; Royal 8vo., pp. x. + 728, with two coloured plates and 272 illustrations in the text. Price: 42s. net.
- HISTORY OF THE GREAT WAR BASED ON OFFICIAL DOCUMENTS: MEDICAL SERVICES—HYGIENE OF THE WAR, Edited by Major-General Sir W. G. Macpherson, K.C.M.G., C.B., L.L.D., Colonel Sir W. H. Horrocks, K.C.M.G., C.B., and Major-General W. W. O. Beveridge, C.B., C.B.E., D.S.O., K.H.P.; Volumes I. and II.; 1923. Edinburgh, 120, George Street: His Majesty's Stationery Office; Demy 8vo., pp. xii. + 400 and 506, with illustrations in the text and diagrams interleaved. Price, post free: 22s. net each volume.

### Medical Appointments.

THE undermentioned have been appointed to the Honorary Medical Staff of the Royal Prince Alfred Hospital, Camperdown, New South Wales: DR. JOHN MORTON (B.M.A.) as Honorary Consulting Surgeon; DR. J. L. MCKELVEY (B.M.A.) as Honorary Surgeon; DR. E. M. FISHER (B.M.A.) and DR. T. M. FURBER (B.M.A.) as Honorary Assistant Surgeons. The appointment of DR. C. E. WASSELL (B.M.A.) as Senior Temporary Honorary Assistant Surgeon was confirmed and DR. T. FARRANRIDGE (B.M.A.) was appointed as Second Temporary Honorary Assistant Surgeon, both appointments to be held only during the occupation by the Repatriation Department of wards for the treatment of returned soldiers. The temporary appointment was confirmed of the following as Resident Medical Officers: DR. MABEL I. C. BRAY, DR. C. DE MONCHAUX, DR. L. F. DODDS, DR. A. S. EVANS, DR. J. H. HALLIDAY, DR. J. K. HARBISON, DR. KAREN T. HELMS, DR. A. E. H. KENDALL, DR. D. B. LOUDON, DR. R. H. MACDONALD, DR. J. S. REID, DR. ROMA WILLIAMS.

### Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xviii.

MELBOURNE HOSPITAL: Vacancies on the Honorary Medical Staff; also Resident Radiologist.  
 ROYAL PRINCE ALFRED HOSPITAL, SYDNEY: Vacancies on the Medical Staff.

### Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30-34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies Dispensary Balmain United Friendly Societies Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phoenix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, Sain't George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington

### Diary for the Month.

- MAY 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
 MAY 15.—Illawarra Suburbs Medical Association, New South Wales.  
 MAY 16.—Western Australian Branch, B.M.A.: Branch.  
 MAY 17.—Victorian Branch, B.M.A.: Council; Election for Representative Body.  
 MAY 17.—City Medical Association, New South Wales.  
 MAY 22.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.  
 MAY 24.—Brisbane Hospital for Sick Children: Clinical Meeting.  
 MAY 25.—New South Wales Branch, B.M.A.: Branch.  
 MAY 25.—Queensland Branch, B.M.A.: Council.  
 MAY 30.—Victorian Branch, B.M.A.: Council.  
 MAY 31.—South Australian Branch, B.M.A.: Branch.  
 JUNE 1.—Queensland Branch, B.M.A.: Branch.  
 JUNE 6.—Victorian Branch, B.M.A.: Branch.  
 JUNE 8.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 JUNE 8.—Queensland Branch, B.M.A.: Council.  
 JUNE 8.—South Australian Branch, B.M.A.: Council.

### Editorial Notices.

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